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Ground Water Quality Bureau

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RON CURRY
Secretary
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October 15, 2010

Ms. LaDonna Turner
Site Assessment Manager
U. S. EPA Region 6 (6SF-TR)
Technical and Enforcement Branch
Superfund Division
1445 Ross Ave. Suite 1200
Dallas, Texas 75202

RE: Submittal of 6 pre-CERCLIS screening assessments for legacy uranium mines within the Grants Mining District Ambrosia Lake sub-district, McKinley County, New Mexico

Dear LaDonna:

The New Mexico Environment Department ("NMED") Superfund Oversight Section herein submits six (6) pre-CERCLIS screening assessments ("PCS") of legacy uranium mines within the Ambrosia Lake sub-district of the Grants Mining District (see Table 1). NMED staff was not able to visit five (5) of the six (6) sites as part of the screening assessments and, therefore, NMED recommends that site visits be conducted to assess the findings of the previous inspections and confirm current conditions before final determinations for further action under CERCLA are made.

Table 2 presents NMED's prioritization for three (Marquez, Section 12, and Section 10) of the assessed mine sites for additional evaluation and consideration for response action in order to mitigate physical hazards. The Marquez Mine site includes debris piles that have various types of metal pipes, conduits, brackets, shingles, and other material that presents tripping, scraping, poking, and stabbing hazards to humans and animals if they come in contact with the piles. Section 12 and Section 10 sites are closed mine sites, but they were not closed and remediated to meet any particular compliance requirements. Section 12 is under possible consideration for new mine permits from the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD). Coordination with EMNRD is recommended to ascertain the status of and path forward for Section 12 site with respect to further hazard assessment and consideration for regulatory compliance action.

Table 3 presents NMED's prioritization for three (Marquez, Section 12, and Section 10) of the assessed mine sites for evaluation for potential emergency or remedial action to mitigate potential threats to human health and the environment. The Marquez Mine is located next to the San Mateo Creek channel and it is possible that contaminants in the waste rock piles could have been transported to the channel by wind and surface runoff. The contaminants could potentially impact surface water quality and ground water recharged by flow and infiltration in San Mateo Creek. Section 12 and Section 10 sites also present potential for contaminant releases to surface water systems that could be accessed by cattle and other animals. The waste rock piles at the Marquez, Section 12 and Section 10 sites need to be further investigated for the extent and magnitude of radiological contamination at the surface. The Marquez Mine site was within the area assessed in the EPA 2009 Aerial Radiological Survey and shows elevated radioactivity above the level of background radioactivity for the area.

Given the documented reclamation actions, lack of surficial remnants from mining, and scarcity of receptors, no immediate action is recommended at Mary No. 1, United Western, and Vallejo sites at this time beyond area-wide investigations being proposed and performed within the Grant Mining District. Follow up inquiry is necessary to



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determine if the United Western mine is being addressed by Rio Algom Mining, LLC as part of the NRC permit area for the Rio Algom Mill. The United States Forest Service (USFS) owns the surface and mineral rights of the Vallejo mine and, therefore, future activities at the Vallejo mine will be coordinated with the USFS and EPA.

All the mines addressed in the attached PCS conducted underground operations. The mine sites assessed in these reports still have open or covered shafts, which should be evaluated for appropriate protective measures to preclude potential human or animal entrapment, as well as for overall structural stability to prevent collapse. Additionally, shafts that were completed into ore bodies below the water table—both those that are still open and those that may have been improperly backfilled—could provide conduits for contaminant entry into the ore-bearing Westward Canyon member of the Morrison Formation, which is known to be a prolific aquifer and source of water for wells in the area. Additionally, piles of presumed waste materials and possibly some stockpiled ore materials, as well as areas with gamma radioactivity readings above the local background level should be given consideration for further assessment to determine if remedial action is warranted. NMED anticipates that erosion or wind dispersion of such materials may have spread contamination within the immediate vicinity away from individual mine sites.

All legacy uranium mine sites should be assessed physically for the existence of materials with elevated radioactivity that could pose threats to human health and the environment. Mines which accessed ore deposits below the water table (*i.e.*, "wet" mines) necessitated continual dewatering during operation. Contaminants within dewatering effluents may have sorbed to sediments, resulting in ongoing impacts to surface and ground water hydrologic systems to the present day through gradual desorption and remobilization of such contaminants. Additionally contaminant impacts from all mines, originating from leaching of remaining on-site waste and ore materials, initially could affect the surface water system, and thereafter the connected alluvial ground water system as well as underlying bedrock aquifers. These impacts, if they exist, predominantly may be localized to the immediate vicinity of the Site. Additionally, the existence of regional impacts from legacy uranium sites throughout the Grants Mining District to surface and ground water systems has not been determined. Generalized investigations of potential sediment and alluvial ground water impacts from both "wet" and "dry" former uranium mines within the Grants Mining District are recommended as part of regional ground water quality characterization. Depending upon the results of these investigations, additional site-specific water characterization activities might be considered to identify the legacy uranium mine sites from which contamination originates.

NMED will submit site discovery forms for these sites based on further prioritization of the sites in the Grants Mineral District. NMED will work closely with EPA, and NM EMNRD to coordinate and support response actions at the sites. Please contact Earle Dixon of my staff at (505) 827-2890, or me at (505) 827-2908 if you should have any questions.

Sincerely,



Dana Bahar
Manager
Superfund Oversight Section

Enclosures: 6 pre-CERCLIS screening assessments

Copies with enclosures:

Lisa Price, EPA
John Pfeil, NMENMRD
Earle Dixon, NMED

Copies without enclosures:

Kathy Gibson, EPA
Janet Silva, NMED
NMED/GWQB/SOS October 2010 read file

Table 1: Summary of further action under CERCLA recommended.

Mine	Surface ownership	"Dry" or "wet" mining operation*
Marquez	Isabella O. Marquez Trust owns the surface rights and Newmont Mining Corporation owns the mineral rights	wet
Mary No. 1	Homestake Partners	dry
Section 10	No owner on record at County Courthouse	dry
Section 12	Southwest Resources, Inc.	dry
United Western	Rio Algom Mining, LLC	Wet mine (assumed based on limited information available on the site)
Vallejo	US Forest Service owns the surface and mineral rights at the Site	Not determined

*"Dry" mining operations accessed ore above the water table, while "wet" operations necessitated dewatering because ore was accessed below the water table.

Table 2: Sites proposed for additional evaluation and possible emergency response due to potential physical hazards

Priority	Mine	Description of potential physical hazards
1	Marquez	Debris piles appear to be mine and/or office building air ventilation and heating/cooling ductwork and support brackets; electrical conduits for lighting and phone system; roofing shingles; sheet metal; and other miscellaneous debris.
2	Section 12	The Site has a hoist frame, a cover over the main shaft, a hoist engine house, an office building, an equipment yard, a maintenance shop, radioactive waste rock/low grade ore piles, and a surface depression that stores water on a periodic basis.
3	Section 10	Site is likely to have a poorly sealed shaft/cover that is not well-engineered. The shaft could be partially open to inadvertent intruders or burrowing animals. There may be debris or abandoned equipment/materials on the surface near the main shaft.

Table 3: Sites proposed for additional evaluation and possible emergency response due to potential threats to human health or for release to the environment

Priority	Mine	Description of potential environmental hazards
1	Marquez	Documented occurrence of ore materials onsite could impact both surface and ground water quality within San Mateo Creek basin. Site is located adjacent to the channel of San Mateo Creek. Surface radioactivity measurements at the Site were measured to be above background in the EPA 2009 Aerial Radiological Survey and in a 2010 site reconnaissance survey by a contractor to the New Mexico Mining and Mineral Division.
2	Section 12	Waste rock/ore piles could provide releases to the surface drainage system and potential migration of contaminants to ground water. Eolian transport to and contact of waste rock/ore piles with standing water could introduce contaminants to water that could be consumed by cattle and animals.
3	Section 10	Waste rock/ore piles could provide releases to the surface drainage system and potential migration of contaminants to ground water.



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Memorandum

To: LaDonna Turner, Site Assessment Manager
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: Dana Bahar, Manager, Superfund Oversight Section
Ground Water Quality Bureau, New Mexico Environment
Department

Date: October 8, 2010

Subject: Pre-CERCLIS Screening Assessment of the Marquez Mine (Grants
Mining District), McKinley County, New Mexico: Further action under
CERCLA recommended

Site name	Marquez Mine	Alternative names	Marcus, Calumet
Street address	not applicable	City	not applicable
Zip code	not applicable	State	New Mexico
Latitude	35.34226	County	McKinley
Longitude	107.75867	TRS	T13N, R9W, Sec 23 NE/SW

Site physical description:

The Marquez Mine ("Site") is located approximately 2.5 miles east of the junction of State highways 509 and 605 (Ref. 1). The Site is approximately 13.5 miles directly north of Grants, NM. The Site is located in the Dos Lomas 7.5 minute USGS 1:24000 scale topographic map quadrangle at latitude 35.34226, longitude 107.75867, and elevation approximately 6,912 ft above sea level. The total area of the Site is unknown (Ref. 2).

Figure 1 is a general location map and Figure 2 is a site map of Section 23. Figure 3 is a Google Earth figure-photograph. Figures 1, 2, and 3 are contained in Attachment A.

The Site is located along the southern side of the San Mateo Creek alluvial drainage channel north of La Jara Mesa (Ref. 2).

Site identification:

The Site is one of numerous legacy uranium sites within the Grants Mining District, Ambrosia Lake Subdistrict, San Mateo Creek watershed, Bluewater Underground Basin.

Site summary: The Site is part of the Poison Canyon uranium mineralization trend which occurs in the Westwater Canyon Member of the Morrison Formation. The Marquez is the largest uranium deposit within the

Poison Canyon trend (Ref. 3). Based on a visit by Anderson (1980), the number of disturbed acres is unknown (Ref. 2).

Field radioactivity readings were measured by Anderson in 1980 (Ref. 3). The main dump measured 800-2,500 cps (48,000 – 150,000 cpm or 274 - 857 $\mu\text{R/hr}$). A stockpile of ore measured 10,000 cps (600,000 cpm or 3,428 $\mu\text{R/hr}$). High readings were measured on a streambed road near or leading to the site but no concentrations were provided with reference to a background reading to help gage the road readings as "high" (Ref. 3). A 10 degree incline shaft was noted at the site (Ref. 3). The field notes by Anderson (1980) also indicated buildings were removed but the concrete building foundations were still present; the main portal was secured with mesh metal gate; additional waste rock-ore dumps were present; there was mining-related debris near the San Mateo Creek channel; and a waste rock and/or /stockpile of ore was present near south creek bank.

✓ In 1987 Santa Fe Pacific Gold Company backfilled the declined adit shaft and removed other structures. The Site was regraded with approximately 12 inches of top soil but apparently the soil was mostly sand (Ref. 3).

Targets:

The Site is located adjacent to the south bank of the alluvial channel for the San Mateo Creek surface water drainage system. The San Mateo Creek alluvial drainage system is in hydraulic connection with bedrock aquifer units in the area. There is a potential for contaminant releases at the Site to become mobilized by wind and surface water to where off site exposure is a possibility. The Site is located less than 0.5 mile from Highway 609 and could be accessed by trespassers traveling along the road. It is assumed the Site is accessible by cattle and local animals like deer, coyotes, and prairie dogs.

Potential impacts to the alluvial ground water system during Site operation may have occurred from ground water discharges from mine workings to settling ponds and ultimately to the San Mateo Creek drainage. Some portion of discharged contaminants may adhere to sediments, and propagate episodically downgradient in response to stream flows within the San Mateo Creek drainage. Current details of alluvial ground water flow are unknown, but are thought to follow general topographic slope (i.e., locally northwest from the site, and generally south in the direction of surface water flow). Such alluvial ground water impacts may also propagate into underlying bedrock aquifers through stratigraphic, structural, and/or anthropogenic (e.g., leaky wells, mine shafts) interconnections. Additional contaminant mobilization in ore-bearing Westwater Canyon Formation could result from oxygenated ground water influx resulting from progressive basin recharge following cessation of mining activities.

Well records from the New Mexico Office of the State Engineer that are located within a four-mile radius of the Site are shown in Table 1 (Ref. 4). The Site is located less than a few hundred feet from the south bank of the channel for San Mateo Creek (SMC). Five domestic wells are located between 0.75 – 1.0 miles of the Site.

Site ownership and Potential Responsible Parties:

Farris
Mn
The history of site ownership and potential responsible parties information includes the following. From late 1957 to August 1958 Farris Mines, of Grants, drove the main decline leading from the surface down to the ore zone, estimated at approximately 1,400 feet or more from the surface (Ref. 2). Farris Mines was a contractor to the site owner, Calumet and Hecla Inc., of Chicago, Illinois. From 1958 to 1964 Calumet & Hecla owned and operated the Site, and from 1965 to 1966 United Nuclear Corporation worked the Site. From 1970 to 1972 the Kerr-McGee Corporation controlled the Site. The Site was idle and was not mined by the Kerr-McGee Corporation, although leaching operations were planned (Ref. 2).

Ted and Dianne Schmitt own the surface rights and Newmont Mining Corp. owns the mineral rights at the Site. The Site is located on private land (Ref. 2 and Ref. 7).

File review:

Files and information sources that were reviewed for this assessment are listed below.

Site reconnaissance:

NMED made an attempt on July 26, 2010 to access the Site, but the property owner of the Marquez Mine was not home.

In October 2009, the USEPA, Office of Emergency Management, National Decontamination Team from Cincinnati, OH conducted an Aerial Radiological Survey of the Grants and Cebolleta Land Grant Areas in New Mexico (Ref. 6). The Airborne Spectrophotometric Environmental Collections Technology (ASPECT) program was employed to survey about 200 square miles and identify areas where surface uranium concentrations were in excess of background concentrations. The survey produced contour plots of: 1) total count rate in counts per second (cps); 2) exposure rate in microroentgen per hour ($\mu\text{R/hr}$); 3) uranium concentration in picocuries per gram (pCi/g); and 4) a plot of individual data points color coded for statistical significance representing deviation from normal background conditions. The survey area that includes the Marquez Mine is presented in Figures 3, 4, and 5. Figures 3 and 5 clearly indicate the level of gamma radioactivity and soil uranium concentration are elevated at the Marquez Mine. The exposure rate appears to be in the 40-60 $\mu\text{R/hr}$ for the Marquez Mine. When the gamma count rate maximum value of 13,500 cps is converted to counts per minute ($\text{cps} \times 60 \text{ sec/min} = 816,000 \text{ cpm}$) then converted to $\mu\text{R/hr}$ ($816,000 / 175 \text{ cpm}/\mu\text{R}$), the 4,628 $\mu\text{R/hr}$ value does not agree with the ASPECT survey results (4,628 $\mu\text{R/hr}$ vs. 40-60 $\mu\text{R/hr}$).

A field visit-site assessment was performed at the Site on September 19, 2010 (Ref. 7) by a contractor to the New Mexico Energy Minerals and Natural Resources Department. The assessment included field notation, radioactivity measures at 0 and 4 feet above the ground surface, and photographs. Radiation readings were taken using a Ludlum Model 192 uR ratemeter (Ref. 7). The background gamma radiation reading was measured at 14 and 13 uR/hr at 0 and 4 feet, respectively. Radiation readings from 12 locations at 0 feet ranged from 21 to 2,200 uR/hr and averaged 406.9 uR/hr (Ref. 7). When the 0 feet high radiation readings are compared to the background radiation level of 14 uR/hr, the radiation at the Site ranged from 1.5 to 157.1 above the background radiation level. Figure 6 which illustrated the measurements is taken from the AUM report (Ref. 7). Radiation readings at 4 feet high ranged from 22 to 380 uR/hr and averaged 121 uR/hr (Ref. 7). When the 4 feet high radiation readings are compared to the background radiation level of 14 uR/hr, the radiation at the Site ranged from 1.6 to 27.1 above the background radiation level.

Recommendation:

Additional investigation of the Site under CERCLA authority is recommended to assess the areal extent of elevated radioactivity readings noted in the Site reconnaissance to determine if threats to human health and the environment exist. NMED also recommends assessment of sediments in the Site vicinity in order to evaluate the potential occurrence of impacts from dispersal of waste materials that have been left on-Site.

The Site should be formally characterized for the radionuclide concentration in the soil profile following a methodology that incorporates a specific grid design and sample node spacing interval to enable the correlation of field readings with laboratory soil sample analysis. The field and laboratory data from the next phase of Site characterization and assessment would indicate the extent of potential hazardous material release and the threat it would present to on site and off site receptors via the soil exposure pathways. Potential physical hazards at the Site, especially the long term performance of soil cover and backfilling of the decline should be assessed and mitigated as soon as possible.

Currently, the existence of regional impacts from legacy uranium sites to the ground water system has not been determined. Ground water had to be pumped from the Marquez mine in order to access the ore deposits, but the location of the effluent discharge is not evident. The bank of San Mateo Creek near the Site should be surveyed to attempt to determine where the effluent discharge may have been routed. Radiological surveying and limited sampling of the 0-6 inch interval of soil at the Site is recommended to determine the extent potential release to the surface. Some samples of the soil profile at intervals of 12, 24, 36, and 48 inches may be appropriate at some locations if field and/or laboratory results indicate more characterization is necessary. A generalized investigation of potential alluvial ground water impacts from "wet" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. If this generalized investigation were to indicate a potential for alluvial ground water impacts, on-Site installation of one or more monitor wells then should be considered.

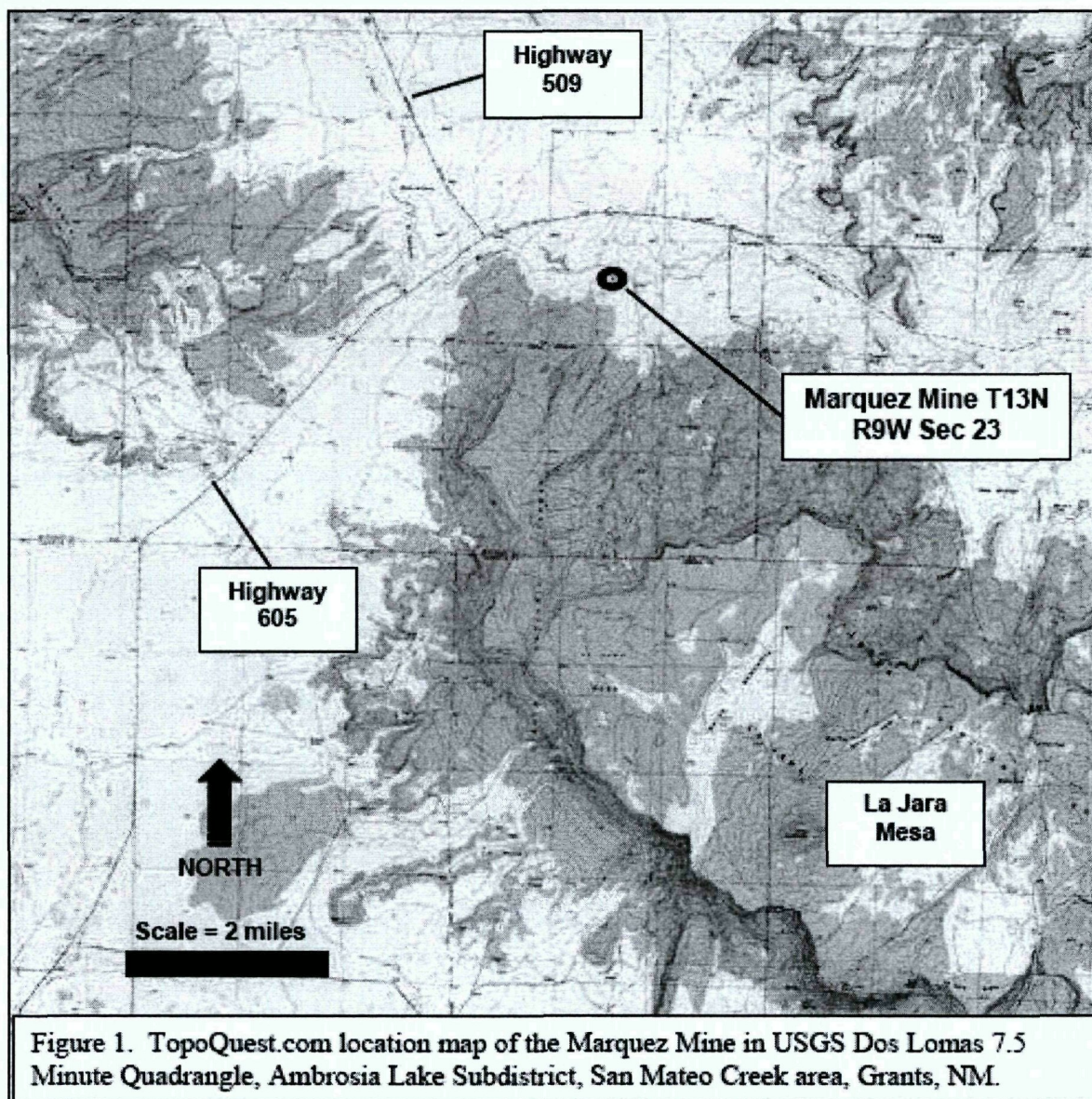
References:

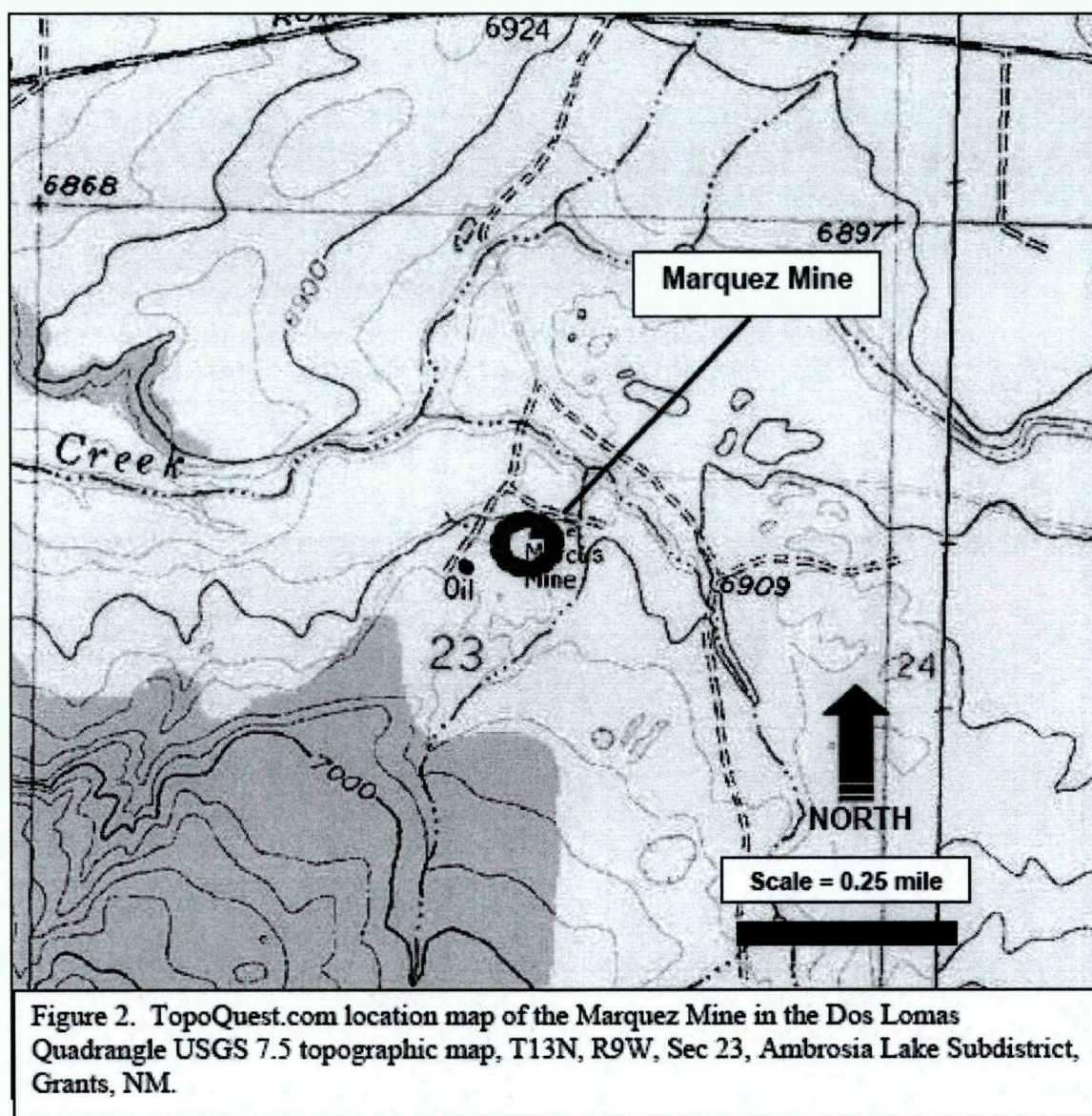
1. USGS, 1957. Dos Lomas, N, Mex. 7.5 minute quadrangle topographic map, 1:24,000 scale.
2. New Mexico Energy, Mineral and Natural Resources Department, undated. "2007-07-20 to NMED-GWQ-Sfund.xls." Spreadsheet excerpt.
3. Rapaport, I., 1963. Uranium deposits of the Poison Canyon Ore Trend, Grants District, in Geology and Technology of the Grants Uranium Region, New Mexico Bureau of Mines and Mineral Resources, Memoir 15, pp. 122-135.
4. New Mexico Office of the State Engineer. "May_08_wells." Shapefile.
5. McLemore, Virginia T. and William L. Chenoweth, revised December 1991. "Uranium mines and deposits in the Grants district, Cibola and McKinley counties, New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 353.
6. U.S. Environmental Protection Agency, Aerial Radiological Survey of the Grants and Cebolleta Land Grant Areas in New Mexico, Office of Emergency Management, National Decommissioning Team, Cincinnati, OH, January 2010, 85 p.
7. INTERA Draft Report September 24, 2010. Abandoned Uranium Mine Assessment for the Marquez Site (NM0039) prepared for the New Mexico Energy, Minerals and Natural Resources Department, 34 p.

Table 1. Well records from the New Mexico Office of the State Engineer located within a 0 – 4 mile distance ring from the Marquez Mine Site, Grants Mining District, New Mexico.

distance from site (miles)	POD REC NBR	POD BASIN	POD NBR	COUNTY	well completion date	DEPTH WELL (ft)	DEPTH WATER (ft)	CASING SIZE (in)	owner name	USE	Diversion (acre ft/yr)
0 - 0.25											
0.25 - 0.50											
0.50 - 0.75											
0.75 - 1.0	706	B	415	McKinley	3/23/1978	32.00	15.00	5.00	NEW MEXICO E.I.A.	Domestic	3
0.75 - 1.0	936	B	415	McKinley	8/10/1977	95.00	72.00	5.00	NEW MEXICO E.I.A.	Domestic	3
0.75 - 1.0	538	B	415	McKinley	8/11/1977	90.00	73.00	5.00	NEW MEXICO E.I.A.	Domestic	3
0.75 - 1.0	898	B	415	McKinley	8/12/1977	80.00	74.00	5.00	NEW MEXICO E.I.A.	Domestic	3
0.75 - 1.0	259	B	1104	McKinley	4/2/1986	303.00	247.00	4.00	SANDOVAL	Domestic	3
1.0 - 2.0	565	B	456	Valencia		0.00	0.00	0.00	SANDOVAL	Stock	3
1.0 - 2.0	180546	B	558	McKinley		0.00	0.00	0.00	N.M. STATE HWY DEPT.	Public	3
1.0 - 2.0	1391	B	659	McKinley	1/18/1979	220.00	190.00	0.00	GARCIA	Domestic	3
1.0 - 2.0	1004	B	861	McKinley		0.00	0.00	0.00	SANDOVAL	Domestic	3
1.0 - 2.0	804	B	1115	McKinley	7/21/1986	478.00	204.00	4.00	MARQUEZ	Domestic	3
1.0 - 2.0	397	B	1190	McKinley	8/31/1989	390.00	37.00	0.00	MARQUEZ	Stock	3
1.0 - 2.0	209713	B	1636	McKinley	5/10/2005	260.00	80.00	4.00	GARCIA	Domestic	3
2.0 - 3.0	183017	B	390	Valencia	12/31/1974	1800.00	900.00	6.63	FERNANDEZ CO. LTD	Irrigation	1386
2.0 - 3.0	375	B	997	Cibola		0.00	0.00	0.00	MARQUEZ	Municipal	3
2.0 - 3.0	190618	B	1544	McKinley	6/14/2003	715.00	624.00	5.00	JACKSON	Domestic	3
3.0 - 4.0	1386	B	414	McKinley		0.00	0.00	0.00	RESERVE OIL & MINERALS CORP	Sanitary	3
3.0 - 4.0	18	B	415	McKinley	8/30/1977	59.00	30.00	5.00	NEW MEXICO E.I.A.	Domestic	3
3.0 - 4.0	992	B	415	McKinley	8/30/1977	72.00	30.00	5.00	NEW MEXICO E.I.A.	Domestic	3
3.0 - 4.0	165	B	415	McKinley	8/30/1977	54.00	30.00	5.00	NEW MEXICO E.I.A.	Domestic	3
3.0 - 4.0	328	B	415	McKinley	8/30/1977	57.00	32.00	5.00	NEW MEXICO E.I.A.	Domestic	3
3.0 - 4.0	155005	B	848	McKinley		0.00	0.00	0.00	KERR-MCGEE NUCLEAR CORP.	Mining	0
3.0 - 4.0	155007	B	848	McKinley	5/14/1981	1611.00	1315.00	4.50	KERR-MCGEE NUCLEAR CORP.	Mining	0
3.0 - 4.0	186776	B	848	McKinley		0.00	0.00	0.00	KERR-MCGEE NUCLEAR CORP.	Mining	0
3.0 - 4.0	197513	B	851	McKinley		0.00	0.00	0.00	KERR-MCGEE NUCLEAR CORP	Dewatering	0
3.0 - 4.0	1412	B	993	McKinley	7/21/1969	1398.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	4735
3.0 - 4.0	1127	B	993	McKinley	1/1/1960	1533.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	4735
3.0 - 4.0	1466	B	1084	McKinley	1/1/1963	320.00	60.00	0.00	FERNANDEZ COMPANY	Stock	0
3.0 - 4.0	175541	B	1485	McKinley	1/28/2002	580.00	280.00	4.00	MARQUEZ	Domestic	3
3.0 - 4.0	227069	SP	3384	McKinley		0.00	0.00	0.00	ROUNDY	Irrigation	0
POD REC NBR: point of diversion record number.						B: Bluewater Basin					
POD BASIN: point of diversion basin						SP: Surface Permit					
POD NBR: point of diversion number											

Attachment A
Figures 1 through 6





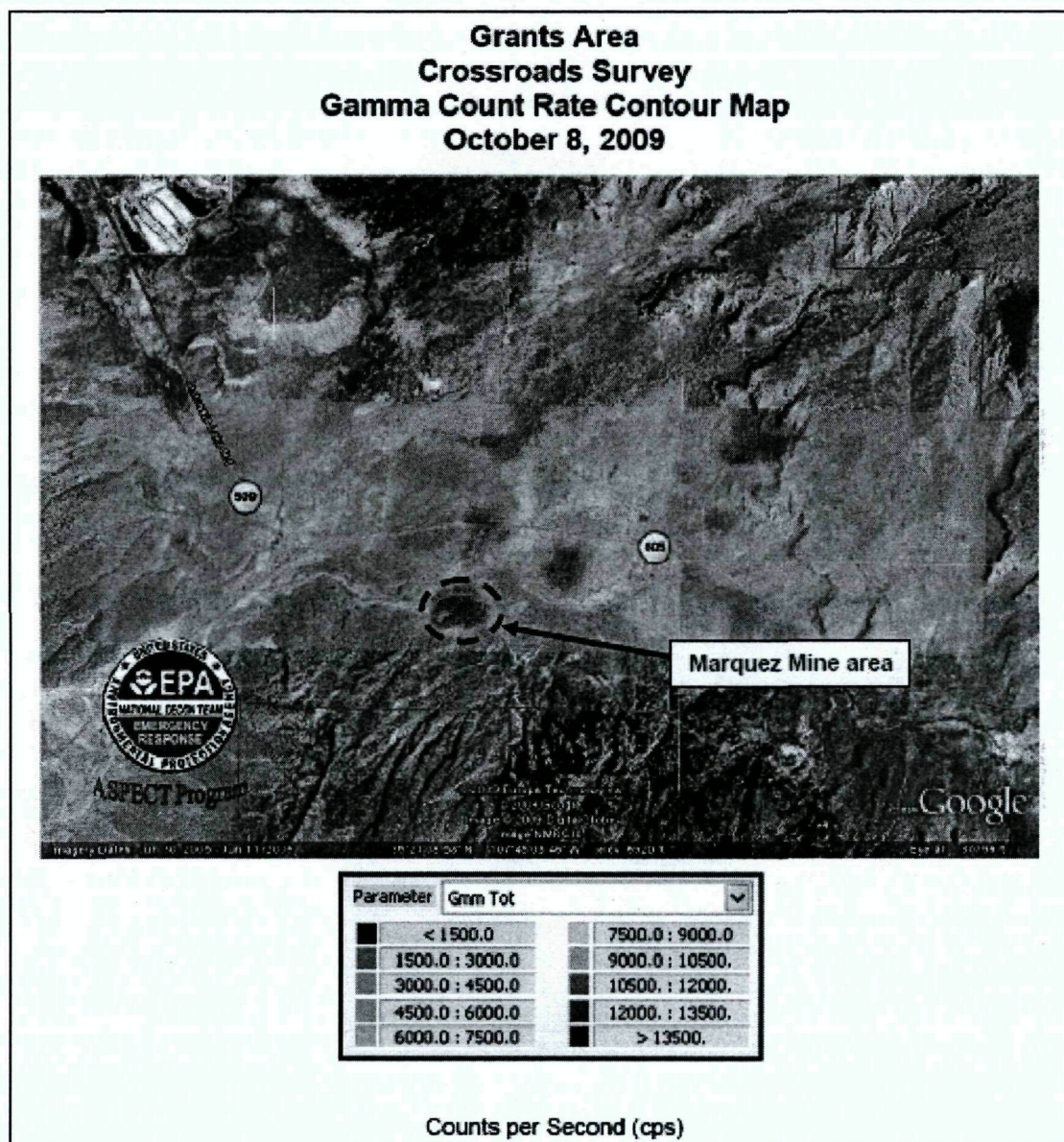


Figure 3. Aerial radiological survey Image 9 of the Grants, NM area conducted by USEPA in October 2009 presenting gamma count rate contour map data in counts per second (cps).

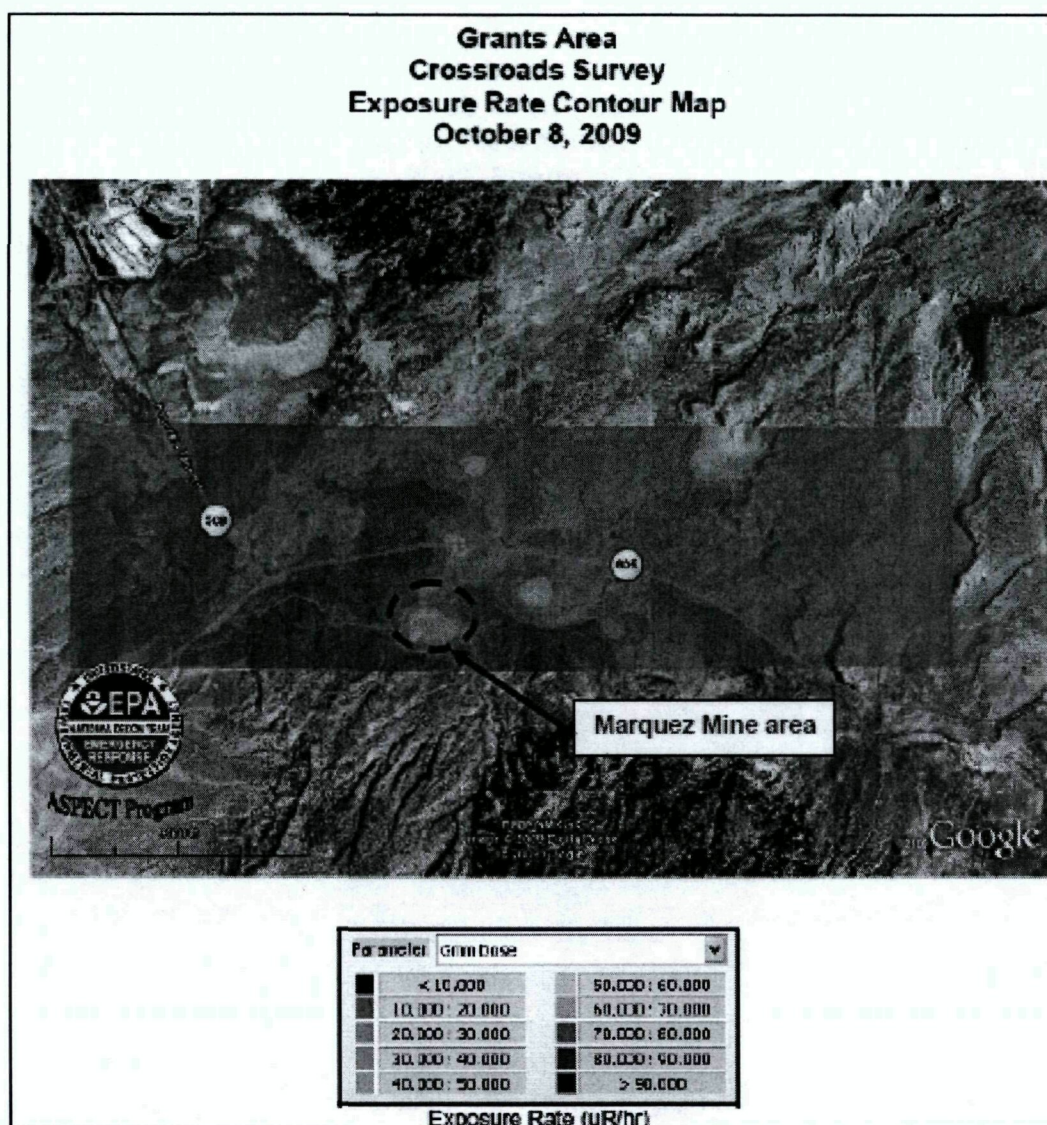


Figure 4. Aerial radiological survey Image 21 of the Grants, NM area conducted by USEPA in October 2009 presenting exposure rate contour map data in microRoentgens /hr ($\mu\text{R/hr}$).

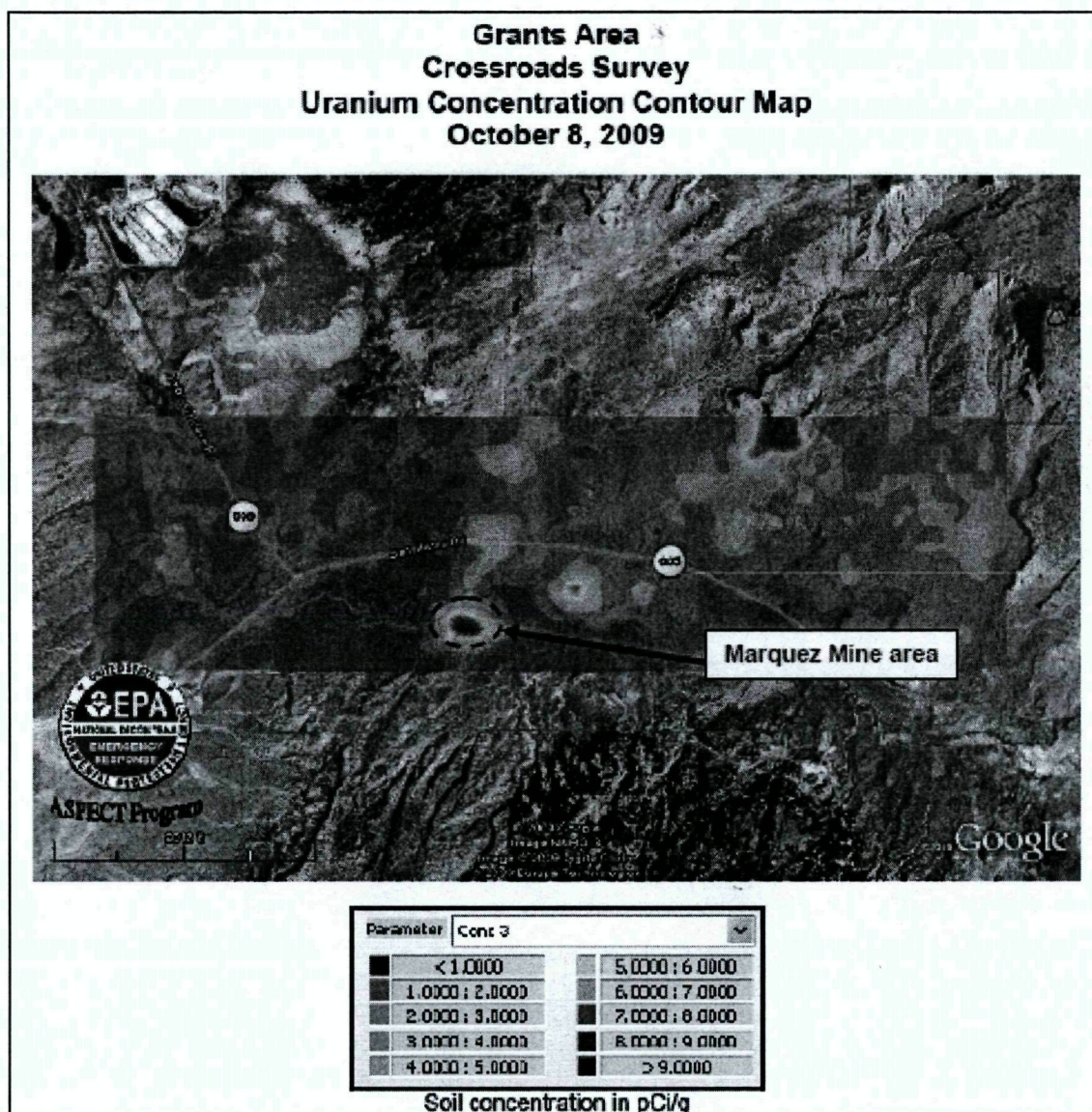


Figure 5. Aerial radiological survey Image 32 of the Grants, NM area conducted by USEPA in October 2009 presenting soil uranium concentration contour map data in picoCuries per gram (pCi/g).



Figure 6. Site map on aerial photo, NM0039-Marquez Mine, Abandoned Uranium Mine Assessment, Figure 4a, Draft Report, September 24, 2010 (Ref. 7).



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Memorandum

To: LaDonna Turner, Site Assessment Manager
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: Dana Bahar, Manager, Superfund Oversight Section
Ground Water Quality Bureau, New Mexico Environment
Department

Date: October 8, 2010

Subject: Pre-CERCLIS Screening Assessment of the United Western
Mine (Grants Mining District), McKinley County, New Mexico:
Further action under CERCLA recommended

Site name	United Western	Alternative names	J and M, Section 36, Lease 60-167, VCA mine
Street address	not applicable	City	not applicable
Zip code	not applicable	State	New Mexico
Latitude	35.25486	County	McKinley
Longitude	107.86624	TRS	T 14N, R 10W, Sec 36, NE, NE

Site physical description:

The United Western Mine Site ("Site") is located approximately 5.7 miles northwest of the junction of State highways 509 and 605 in the Ambrosia Lake – San Mateo Creek areas (Ref. 1). The Site is located in the Ambrosia Lake 7.5 minute USGS 1:24000 scale topographic map quadrangle at latitude 35.25486, longitude 107.86624, and elevation approximately 6,981 ft above sea level. The total acreage of the Site is unknown but appears to be less than 10 acres. Access to the Site is by permission and a locked gate. Figure 1 is a Google Earth location map of the Site, and Figure 2 is location map on the Ambrosia Lake quadrangle map. Figures 1 and 2 are contained in Attachment A.

The United Western Mine is located on the immediate northwest boundary of the Rio Algom Mill (formerly Kerr McGee) which is in the final stages of decommissioning under the Nuclear Regulatory Commission (NRC). Very little is known about the Site, but during a tour of the Rio Algom Mill area on May 11, 2010, NMED staff drove past the Site and noticed that the shaft was covered and fenced off.

Site identification:

San Mateo Creek watershed, Bluewater Underground Basin. The Site is one of numerous legacy uranium sites within the Grants Mining District.

Site summary:

Very little is known about the Site. Apparently the shaft was started in 1954 and the mine was last active in the early 1960's (Ref. 2)

Targets:

The Site is located 1000 feet east of the Arroyo del Puerto where it bends northward at the northwest property boundary of the Rio Algom Mill Site. The Site appears to be located next to the Rio Algom Mill Site property boundary. The Site is located roughly one mile due west of Highway 509 along the northern section line boundary for Sections 32 and 31. The Arroyo del Puerto joins San Mateo Creek south of the junction between state highways 509 and 605. The San Mateo Creek alluvial system has the potential to be in hydraulic communication with bedrock aquifers.

If mine dewatering occurred during operation, it is likely that the water was discharged to the Arroyo del Puerto. The Site also has the potential to supply surface sediment or soil to Arroyo del Puerto during high precipitation runoff events. The Site is accessible by range cattle and animals, but human trespassers and inadvertent intruders would have to pass through or over locked gates to get on the Site. The hoist frame structure and various pieces of equipment could present physical hazards to humans.

Well records from the New Mexico Office of the State Engineer that are located within a four-mile radius of the Site are shown in Table 1 (Ref. 3).

Site ownership and Potential Responsible Parties:

The history of site ownership and potentially responsible parties for the Site is as follows. The site was leased through the New Mexico State land Office to United Western Minerals Company of Santa Fe. The site was operated by the Vanadium Corporation of America from 1957 to 1958. From 1959-1960 the Site was operated by Jordan and Marshall of Grants, NM, under contract to Vanadium Corporation of America. The surface rights have since been acquired by Rio Algom Mining, LLC Mill (Ref. 2).

File review:

Files that were reviewed for this assessment are listed below.

Site reconnaissance:

In 1980 Anderson visited the Site, described several features, and collected radiological readings. Anderson observed a mine dump; a powder magazine, evidence of subsidence around the main shaft; and a small wood timber head frame (Ref. 4). The mine dump indicated 700-900 counts per second (42,000-56,000 cpm or 240-320 $\mu\text{R/hr}$). According to records from 1989, the shaft had been backfilled, buildings were removed, and equipment was salvaged. The Mine produced such a small volume of ore, it was categorized as an exempt quantity (<20,000 tons?).

In 2008, a contractor to the Mining and Minerals Division performed a field radiological survey (Ref. 5). Figure 3 presents a diagram of the Site and the field radiological survey locations. The surface readings ranged from 16-30 $\mu\text{R/hr}$ and averaged 20 $\mu\text{R/hr}$.

Recommendation:

A site visit is recommended to assess the potential for surface physical and radioactivity hazards and determine if threats to human health and the environment exist. In addition, follow up inquiry is necessary to determine if the mine is being addressed by Rio Algom Mining, LLC as part of the NRC permit area for the Rio Algom Mill.

The Site should be given consideration in the regional characterization of ground water potentially impacted by legacy uranium mining activities. A generalized investigation of potential alluvial ground water impacts from "wet" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. Data from other former "wet" mines suggest that re-saturation of the ore-host Morrison Formation, following cessation of pumping for mine dewatering, may be causing mobilization of uranium and associated minerals, and consequent degradation of ground water quality, due to influx of oxygenated ground water. If this recommended, generalized investigation were to indicate a potential for alluvial and/or deep ground water impacts, on-Site or nearby installation of one or more monitor wells may be considered necessary at a future date.

References:

1. USGS, 1957. Ambrosia Lake, N, Mex. 7.5 minute quadrangle topographic map, 1:24,000 scale.
2. New Mexico Energy, Mineral and Natural Resources Department, undated. "2007-07-20 to NMED-GWQ-Sfund.xls." Spreadsheet excerpt.
3. New Mexico Office of the State Engineer. "May_06_wells." Shapefile.
4. Anderson, Orin J., 1980. "Abandoned or inactive uranium mines in New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 148.
5. Soder Miller Associates, Field data collected from NM Mining and Mineral Division, October 2008.

Table 1. Well records from the New Mexico Office of the State Engineer located within a 0 – 4 mile distance ring from the United Western Mine Site, Grants Mining District, New Mexico.

distance from site (miles)	POD REC NB	POD BASIN	POD NBR	well completion date	DEPTH WELL (ft)	DEPTH WATER (ft)	CASING SIZE (in)	owner name	USE
0 - 0.25									
0.25 - 0.50									
0.50 - 0.75									
0.50 - 0.75	949	Bluewater	00539		0.00	0.00	0.00	N.M. STATE HIGHWAY DEPT.	Public
0.50 - 0.75	695	Bluewater	00580		0.00	0.00	0.00	STAR LAKE RAILROAD CO.	Construction
0.50 - 0.75	186806	Bluewater	01145		0.00	0.00	0.00	N.M. STATE HIGHWAY DEPARTMENT	Highway
0.75 - 1.0									
0.75 - 1.0	185190	Bluewater	00481	3/22/1984	29.00	4.00	4.00	KERR-MCGEE CORPORATION	
0.75 - 1.0	1285	Bluewater	00522	2/7/1978	70.00	0.00	0.00	UNITED NUCLEAR-HOMESTAKE PTNRS	Monitoring
0.75 - 1.0	180648	Bluewater	00522	2/7/1978	70.00	0.00	5.00	UNITED NUCLEAR-HOMESTAKE PTNRS	Monitoring
0.75 - 1.0	378	Bluewater	00994	3/23/1968	810.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
1.0 - 2.0	97	Bluewater	00384	8/31/1956	735.00	0.00	6.00	ANDERSON DEVELOPMENT CORP.	Mining
1.0 - 2.0	785	Bluewater	00386	12/31/1955	760.00	0.00	4.50	RIO ALGOM MINING LLC	Mining
1.0 - 2.0	183001	Bluewater	00371	8/25/1956	752.00	0.00	6.83	SABRE-PINON CORPORATION	Mining
1.0 - 2.0	182189	Bluewater	00481		0.00	0.00	0.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	183191	Bluewater	00481		800.00	0.00	4.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	183192	Bluewater	00481		1100.00	0.00	4.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	183193	Bluewater	00481		200.00	0.00	4.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	183194	Bluewater	00481		300.00	0.00	4.00	KERR-MCGEE CORPORATION	
1.0 - 2.0	532	Bluewater	00994	9/18/1958	857.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
1.0 - 2.0	1170	Bluewater	00994	6/8/1958	750.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
1.0 - 2.0	823	Bluewater	00994	3/16/1970	779.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
2.0 - 3.0	620	Bluewater	00382	11/30/1956	3093.00	0.00	10.75	RIO ALGOM MINING LLC	Mining
2.0 - 3.0	29	Bluewater	00383	4/30/1958	745.00	0.00	4.50	RIO ALGOM MINING LLC	Mining
2.0 - 3.0	851	Bluewater	00385	1/31/1956	793.00	0.00	6.83	ANDERSON DEVELOPMENT CORP.	Mining
2.0 - 3.0	1490	Bluewater	00372	9/12/1956	796.00	0.00	6.83	SABRE-PINON CORPORATION	Mining
2.0 - 3.0	217	Bluewater	00375	1/2/1957	801.00	0.00	10.75	PHILLIPS PETROLEUM COMPANY	Industrial
2.0 - 3.0	1173	Bluewater	00378	2/7/1957	3366.00	0.00	16.00	UNITED NUCLEAR CORPOATION	Industrial
2.0 - 3.0	395	Bluewater	00994	1/9/1959	848.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
2.0 - 3.0	1428	Bluewater	00994	4/5/1959	1094.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
3.0 - 4.0	354	Bluewater	00373	12/31/1956	1003.00	0.00	13.38	RIO ALGOM MINING LLC	Mining
3.0 - 4.0	1225	Bluewater	00994	1/2/1959	827.00	0.00	0.00	RIO ALGOM MINING LLC	Mining
3.0 - 4.0	194392	Bluewater	01559	3/19/2004	800.00	860.00	5.00	GRIDER	Stock
POD REC NBR: point of diversion record number.									
POD BASIN: point of diversion basin									
POD NBR: point of diversion number									

Ms. LaDonna Turner

Pre-CERCLIS screening assessment of the United Western Mine (Grants Mining District), McKinley County, New Mexico

October 8, 2010

Page 5 of 8

Attachment A

Figures 1, 2, and 3

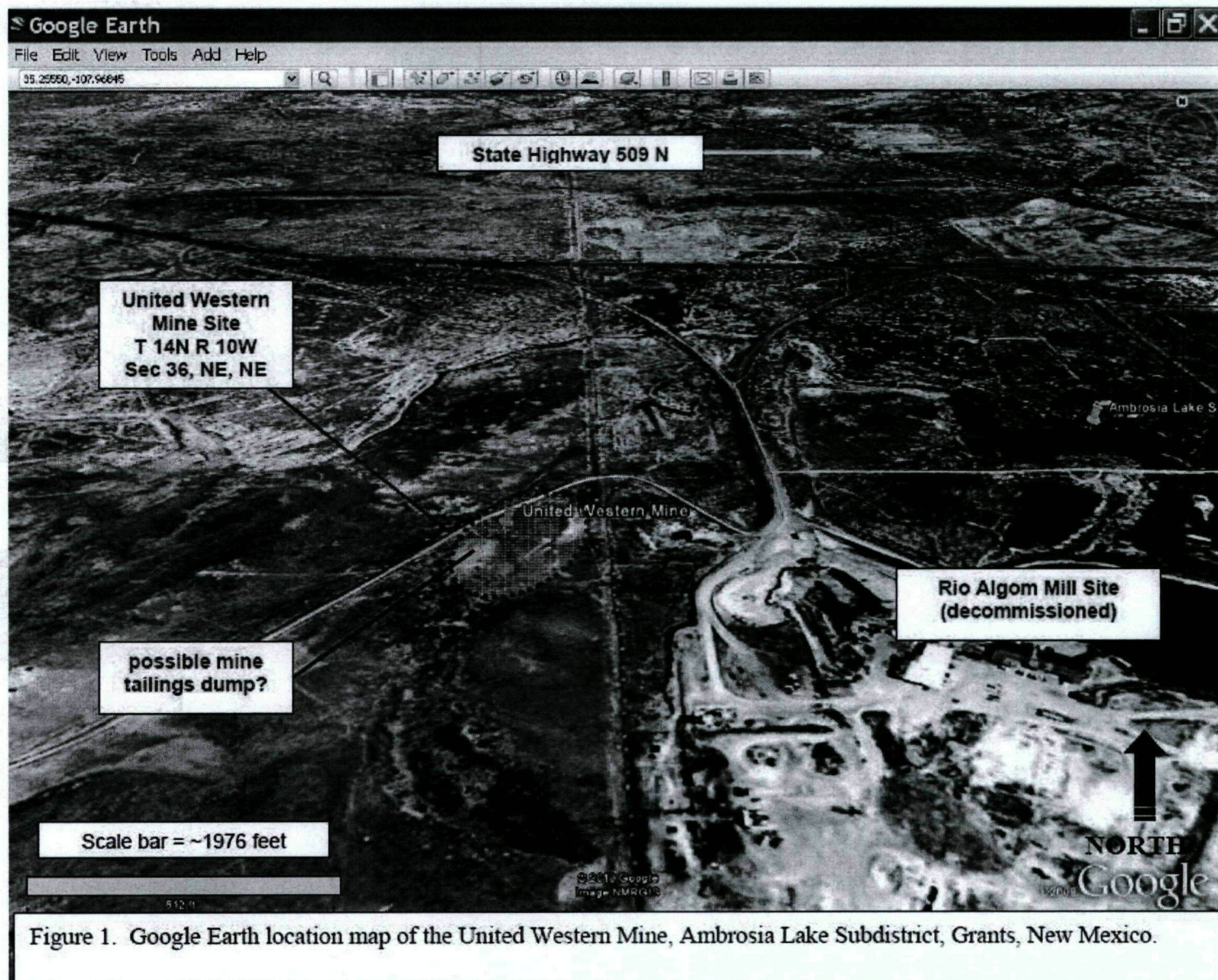


Figure 1. Google Earth location map of the United Western Mine, Ambrosia Lake Subdistrict, Grants, New Mexico.

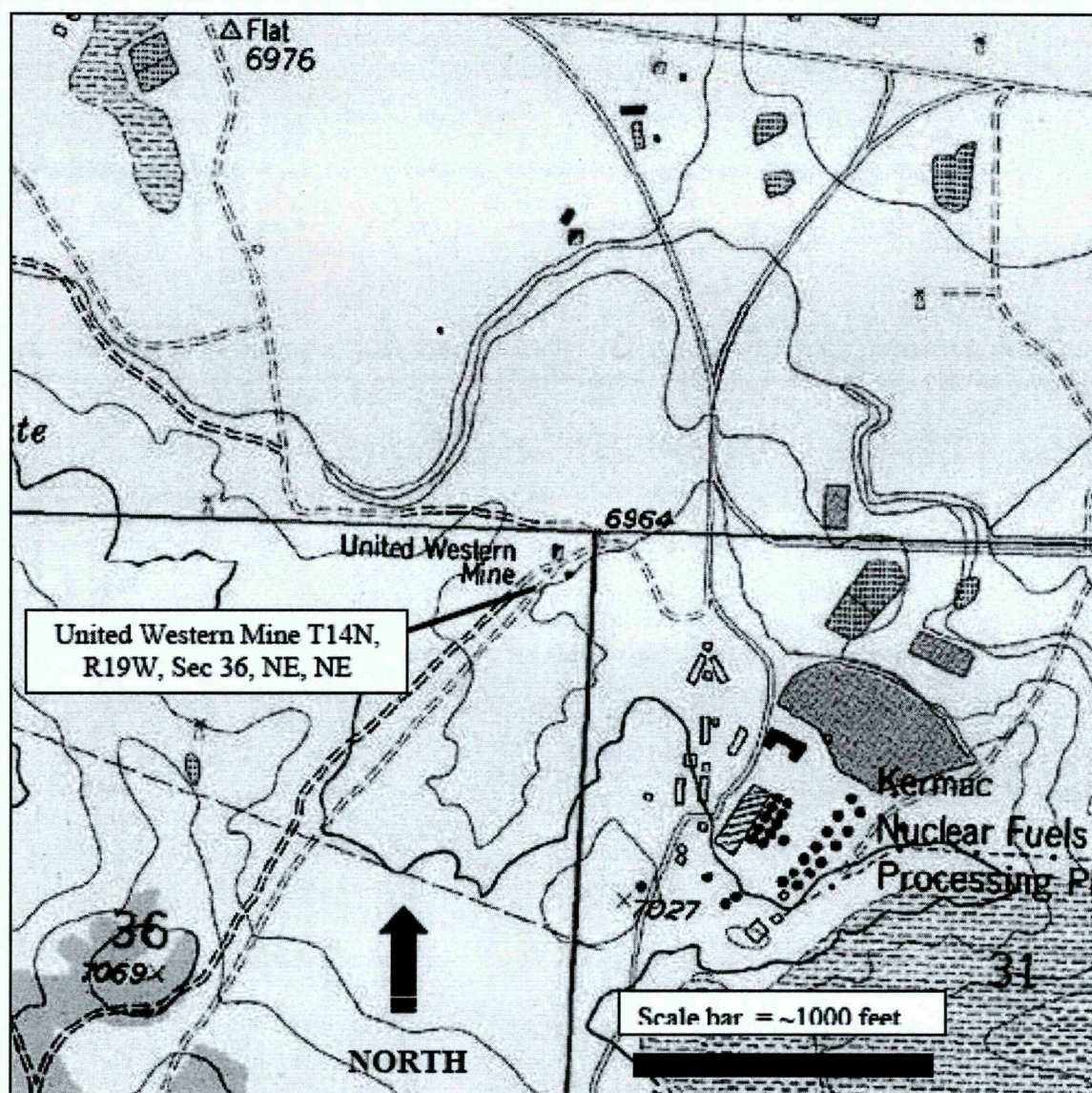


Figure 2. TopQuest.com location map of United Western Mine in the USGS topographic map Ambrosia Lake 7.5 minute quadrangle.

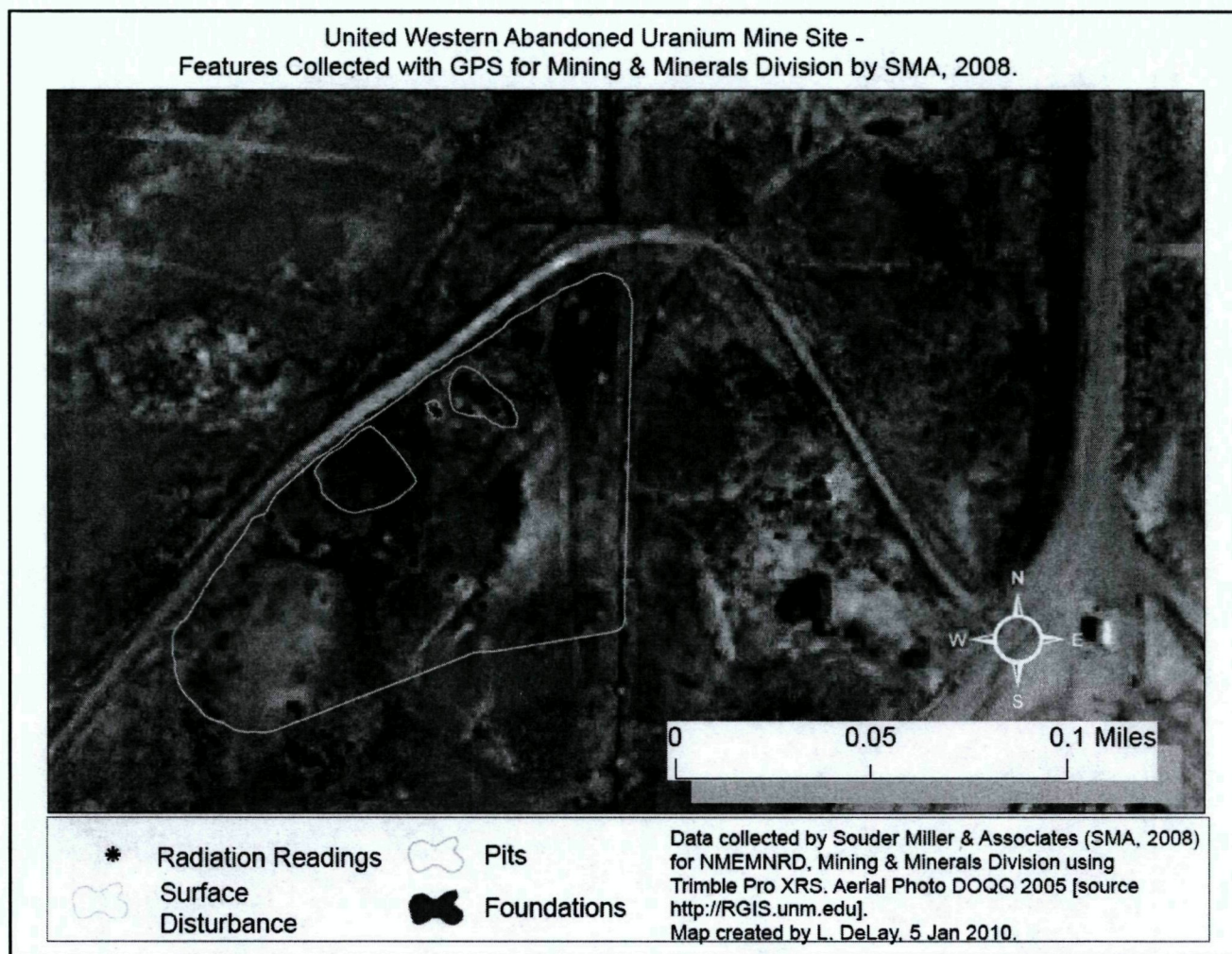


Figure 3. Aerial photograph map of the United Western Mine Site with radiological reading locations marked as red dots. Radiological readings averaged 20 $\mu\text{R/hr}$ at the surface, and ranged from 16 – 30 $\mu\text{R/hr}$.



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RON CURRY
Secretary
SARAH COTTRELL
Deputy Secretary

Memorandum

To: LaDonna Turner, Site Assessment Manager
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: Dana Bahar, Manager, Superfund Oversight Section
Ground Water Quality Bureau, New Mexico Environment
Department

Date: October 8, 2010

Subject: Pre-CERCLIS Screening Assessment of the Section 12 Mine
(Grants Mining District), McKinley County, New Mexico:
Further action under CERCLA recommended

Site name	Section 12	Alternative names	Dysart Group, Tana and Alto
Street address	not applicable	City	not applicable
Zip code	not applicable	State	New Mexico
Latitude	35.45263	County	McKinley
Longitude	-107.87289	TRS	T14N, R10W, Sec. 12 SW/SE

Site physical description:

The Section 12 Mine ("Site") is located approximately 8.5 miles northwest of the junction of State highways 509 and 605 (Ref. 1). The Site is located in the Ambrosia Lake 7.5 minute USGS 1:24000 scale topographic map quadrangle at latitude 35.45263, longitude 107.87289, and elevation approximately 7,080 ft above sea level. The total area of the Site is estimated to be 47 acres, but the area visibly disturbed from activities is approximately 10 or more acres (Ref. 2).

Access to the Site is required by permission from the mineral rights permittee, Mr. George Lotspeich, president of Southwest Resources, Inc. of Albuquerque, New Mexico. Figure 1 is a location map and Figure 2 is a site features map. Figures 1 and 2 are contained in Attachment A.

The Section 12 Mine is located approximately 7,000 ft east of the Dysart Mine No. 1 site along the northern side of the ephemeral drainage named Martin Draw (Ref. 3 and Ref. 1). Martin Draw extends southeastward to join Arroyo del Puerto near the northwest end of the Rio Algom Mill Site. The Arroyo del Puerto continues southeastward until it joins San Mateo Creek below the Highway 509-605 junction. Section 12 Mine is located directly adjacent to the original Ambrosia Lake surface water body for which the area and topographic map are named. The presence and size of the lake varies depending on precipitation and time of year.

There is a 30-foot high hoist frame structure with a large sheet metal hopper above the sealed mine shaft. The mine shaft is covered with wooden timbers and concrete sections. The hoist control shack is also present. The one story mine office building is located to the northeast of the shaft, and it is approximately 100 feet (ft) long X 40 ft wide. An equipment yard is located on the north side of the office building that is approximately 177 ft long X 177 ft wide. A shop building is located south of the main shaft and it is approximately 80 ft long X 20 ft wide. No pits or open cuts were found at the Site. The area contains noticeable waste rock piles that are over 100 feet long and several feet high. Photographs 1-6 from July 29, 2010 site visit are contained in Attachment B. Currently, underground access to the Section 12 mine is through the Section 11 (Dysart #2) mine shaft which is an air shaft for Section 12. Another air shaft structure and pipe is located approximately 400 ft NNW of the main shaft. There are two other vent shafts on the property. The Section 12 main shaft is approximately 700 ft deep.

Site identification:

The Site is one of numerous legacy uranium sites within the Grants Mining District, Ambrosia Lake Subdistrict, San Mateo Creek watershed, Bluewater Underground Basin.

Site summary:

Information on the current site physical description is limited and summarized from a brief site reconnaissance visit on July 29, 2010 conducted as part of a New Mexico Energy, Minerals and Natural Resource Department, Mining and Minerals Division (MMD) Mining Act Reclamation Program permit application inspection. NMED accompanied current mineral rights permittee, George Lotspeich; and representatives from MMD and Neutron Energy, a uranium mining company, to the Site. A Ludlum model 14C ratemeter and Ludlum model 44-2 gamma scintillator were used to record readings of radioactivity at the Site. The model 44-2 is a very sensitive probe that reads in counts per minute (cpm). The readings were uncollimated (non-shielded) so the readings represent radioactivity striking the detector from more than one preferred angle which would be perpendicular to the detector face.

Background readings for the Section 12 area are generally less than 5,000 cpm and more commonly about 3,000 cpm. The gamma readings for the Site ranged from a low of 7,000 cpm (40 μ R/hr) at the surface of the concrete side walk on the west side of the office building to a high of 100,000 cpm (571 μ R/hr) at the surface and 80,000 cpm (456 μ R/hr) at 4 ft over by some waste rock on the east side of the north trending main access road. Waste rock piles averaged about 40,000 cpm (228 μ R/hr).

Targets:

The Site is located directly adjacent to the east side of the Martin Draw channel (Ref. 1). Martin Draw eventually joins the Arroyo del Puerto. Distance to the Site from the end of Highway 509 is approximately 1.5 miles. A standing body of shallow water approximately 4 acres in size and located adjacent to the northwest side of the main shaft is believed to be from recent precipitation-surface runoff. This standing body of water is also the feature known as "Ambrosia Lake" (Ref. 1). The Site has the potential to supply surface sediment or soil to Martin Draw and Arroyo del Puerto during high precipitation runoff events. Arroyo del Puerto eventually joins San Mateo Creek south of the Highway 509-605 junction. The Site is accessible by range cattle and animals, but human trespassers and inadvertent intruders would have to pass through or over locked gates to get on the Site. The hoist frame structure and various pieces of equipment could present physical hazards to humans.

Well records for the New Mexico Office of the State engineer that are located within a four-mile radius of the Site are show in Table 1 (Ref. 4).

Table 1. Well records from the New Mexico Office of the State Engineer located within a 0 – 4 mile distance ring from the Section 12 Mine Site, Grants Mining District, New Mexico.

Distance ring from site (miles)	POD REC NB	POD BASIN	POD NBR	well completion date	depth of well (ft)	depth to water (ft)	well casing size (in)	owner name	USE	diversion acre/ft yr
0 - 0.25										
0.25 - 0.50										
0.50 - 0.75										
0.75 - 1.0										
1.0 - 2.0	785	Bluewater	00366	12/31/1955	760.00	0.00	4.50	RIO ALGOM MINING LLC	Mining	0
1.0 - 2.0	1490	Bluewater	00372	9/12/1956	796.00	0.00	8.63	SABRE-PINON CORPORATION	Mining	0
1.0 - 2.0	1428	Bluewater	00994	4/5/1959	1094.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
2.0 - 3.0	522	Bluewater	00143	7/18/1950	90.00	60.00	0.00	ANDREWS	Domestic	3
2.0 - 3.0	620	Bluewater	00362	11/30/1956	3093.00	0.00	10.75	RIO ALGOM MINING LLC	Mining	0
2.0 - 3.0	29	Bluewater	00363	4/30/1956	745.00	0.00	4.50	RIO ALGOM MINING LLC	Mining	0
2.0 - 3.0	97	Bluewater	00364	8/31/1956	735.00	0.00	6.00	ANDERSON DEVELOPMENT CORP.	Mining	0
2.0 - 3.0	851	Bluewater	00365	1/31/1956	793.00	0.00	6.63	ANDERSON DEVELOPMENT CORP.	Mining	0
2.0 - 3.0	183001	Bluewater	00371	8/25/1956	752.00	0.00	8.63	SABRE-PINON CORPORATION	Mining	0
2.0 - 3.0	354	Bluewater	00373	12/31/1956	1003.00	0.00	13.38	RIO ALGOM MINING LLC	Mining	0
2.0 - 3.0	1285	Bluewater	00522	2/7/1978	70.00	0.00	0.00	UNITED NUCLEAR- HOMESTAKE PTNRS	Monitoring Point	0
2.0 - 3.0	180648	Bluewater	00522	2/7/1978	70.00	0.00	5.00	UNITED NUCLEAR- HOMESTAKE PTNRS	Monitoring Point	0
2.0 - 3.0	532	Bluewater	00994	9/18/1958	857.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
2.0 - 3.0	376	Bluewater	00994	3/23/1958	810.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
2.0 - 3.0	1170	Bluewater	00994	6/8/1958	750.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
2.0 - 3.0	823	Bluewater	00994	3/16/1970	779.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
2.0 - 3.0	1225	Bluewater	00994	1/2/1958	827.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
3.0 - 4.0	188190	Bluewater	00481	3/22/1984	28.00	4.00	4.00	KERR-MCGEE CORPORATION		0
3.0 - 4.0	849	Bluewater	00539		0.00	0.00	0.00	N.M. STATE HIGHWAY DEPT.	Public	0
3.0 - 4.0	695	Bluewater	00680		0.00	0.00	0.00	STAR LAKE RAILROAD CO.	Construction	0
3.0 - 4.0	1167	Bluewater	01087	5/25/1985	651.00	566.00	5.00	ALBERS BROTHERS	Stock	3
3.0 - 4.0	186606	Bluewater	01145		0.00	0.00	0.00	N.M. STATE HIGHWAY DEPARTMENT	Highway	0
3.0 - 4.0	436	Bluewater	01246	4/29/1992	1200.00	700.00	6.63	ELKINS	Stock	3
POD REC NBR: point of diversion record number.										
POD BASIN: point of diversion basin										
POD NBR: point of diversion number										

Site ownership and Potential Responsible Parties:

The history of site ownership and potentially responsible parties for the Site includes the following. In 1961 Anderson Development Company, of Albuquerque, operated the Site. From 1962 to 1963 Stella Dysart, of Albuquerque, owned and operated the Site. In early 1977 Hydro Nuclear Corporation operated the Site. From July 1977 to July 1978 Cobb Nuclear Corporation, of Albuquerque, owned the site and subcontracted operations to Nuclear Power and Energy, of Grants. Cobb Nuclear operated the site from August 1977 to August 1979. From August 1979 to April 1980 Cobb Nuclear contracted with Koppen Mining and Construction Corporation, of Albuquerque, to operate the site. In 1980 United Nuclear Corporation also operated the Site. Cobb Nuclear operated the site from April 1980 to August 1981. From late 1981 to 1983 Cobb Resources Corporation, of Albuquerque, operated the site. There was no mineral production in 1983. Southwest Resources, Inc. submitted a mine permit application to the New Mexico Energy, Minerals, and Natural Resources Department, Mining and Minerals Division for the Site. Neutron Energy is interested in the Site as of summer 2010. The Bureau of Land Management is the surface land manager for the Site. Southwest Resources, Inc. is listed as the owner of mineral rights (Ref. 5 and 6).

File review:

Files and information sources that were reviewed for this assessment are listed below.

Site reconnaissance:

An abbreviated Abandoned Uranium Mine (AUM) site assessment and Mining Act pre-permitting inspection was conducted by the Mining and Minerals Division on July 29, 2010.

Recommendation:

Additional investigation of the Site under CERCLA authority is recommended to assess any physical hazards as well as the areal extent of elevated radioactivity readings noted in the most recent Site reconnaissance to determine if threats to human health and the environment exist. NMED also recommends assessment of sediments in surface water drainages originating or crossing this Site to evaluate the potential occurrence of impacts from dispersal of waste materials that have been left on-Site.

Currently, the existence of regional impacts from legacy uranium sites to the ground water system has not been determined. Ground water impacts from "dry" mines such as this Site initially would impact the alluvial ground water system through leaching of on-site waste materials and ore stockpiles. Such impacts, if they exist, predominantly may be localized to alluvial ground water in the vicinity of the Site from leaching prior to Site reclamation. Alternatively ground water impacts may be more widespread, contributing to the overall potential degradation of the alluvial ground water regionally, as well as potentially to impacts to ground water in underlying bedrock aquifers. A generalized investigation of potential alluvial ground water impacts from "dry" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. Depending upon the results of this investigation, additional site-specific alluvial ground water characterization might be considered.

References:

1. USGS, 1957. Ambrosia Lake, N, Mex. 7.5 minute quadrangle topographic map, 1:24,000 scale.
2. Natural Resource Conservation Service, Web Soil Survey website: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>, accessed 8/10/2010.
3. New Mexico Environment Department, GWQB, SOS, Memorandum-Draft 8/4/2010 to LaDonna Turner EPA Region 6: Pre-CERCLIS Screening Assessment of the Dysart #2 mine, 8 pp.
4. New Mexico Office of the State Engineer. "May_06_wells." Shapefile.
5. New Mexico Energy, Mineral and Natural Resources Department, undated. "2007-07-20 to NMED-GWQ-Sfund.xls." Spreadsheet excerpt.
6. USGS, 1957. Ambrosia Lake
6. McLemore, Virginia T. and William L. Chenoweth, revised December 1991. "Uranium mines and deposits in the Grants district, Cibola and McKinley counties, New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 353.

Attachment A

Figures 1 and 2

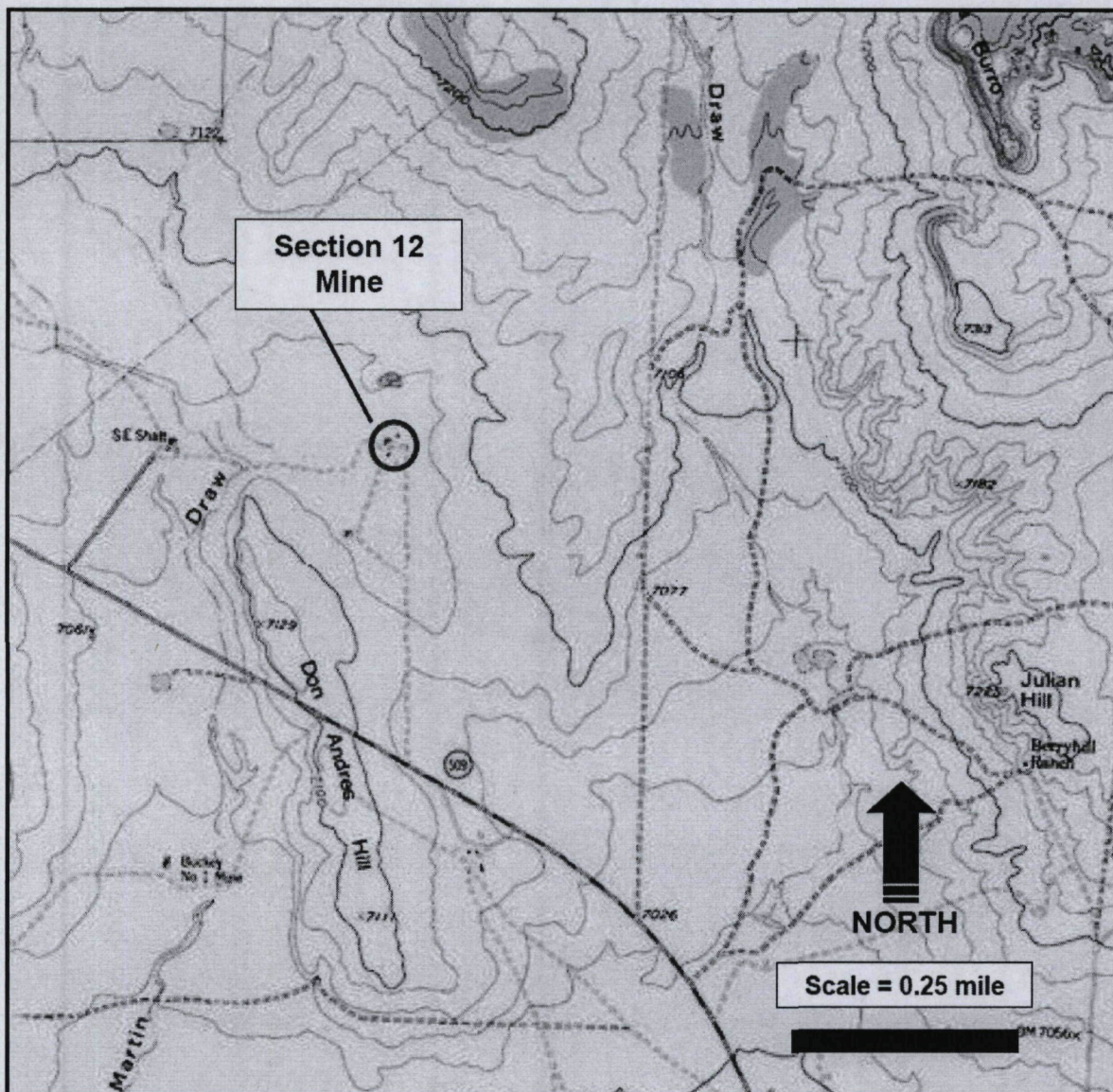
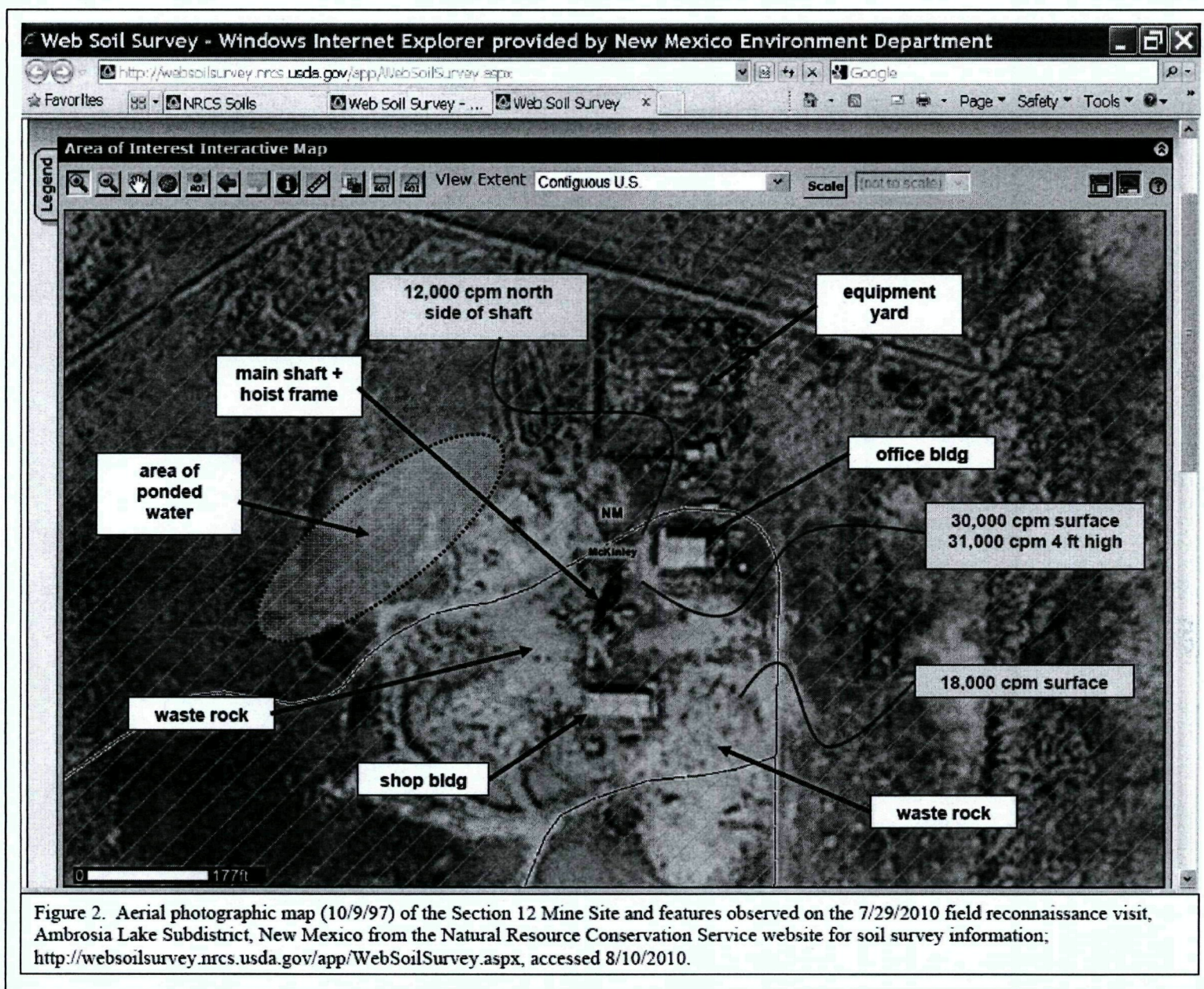


Figure 1. TopoQuest.com location map of the Section 12 Mine in the Ambrosia Lake Quadrangle USGS 7.5 topographic map, T14N, R10W, Sec 12, Ambrosia Lake Subdistrict, Grants, NM.

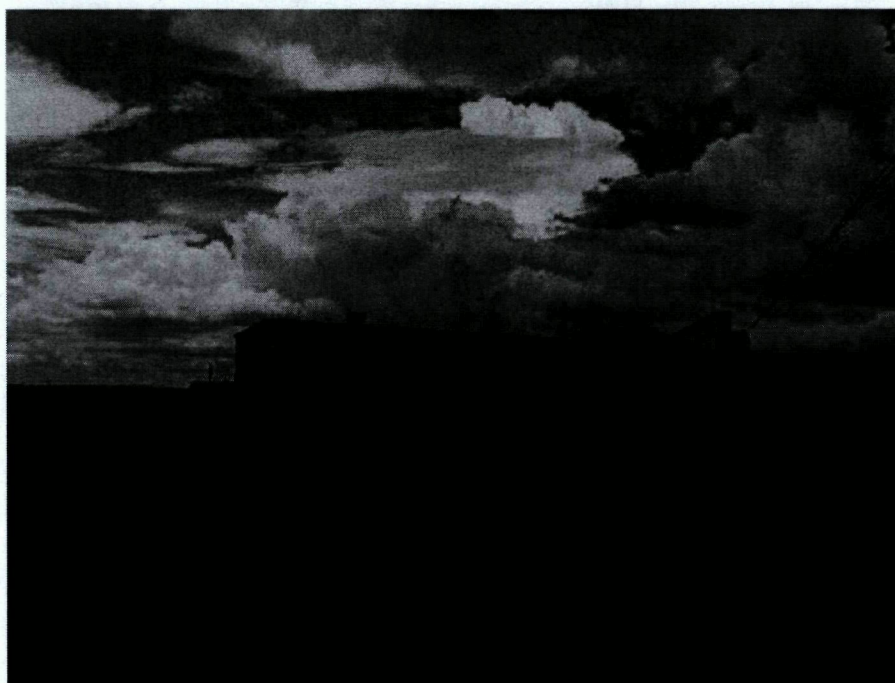


Attachment B

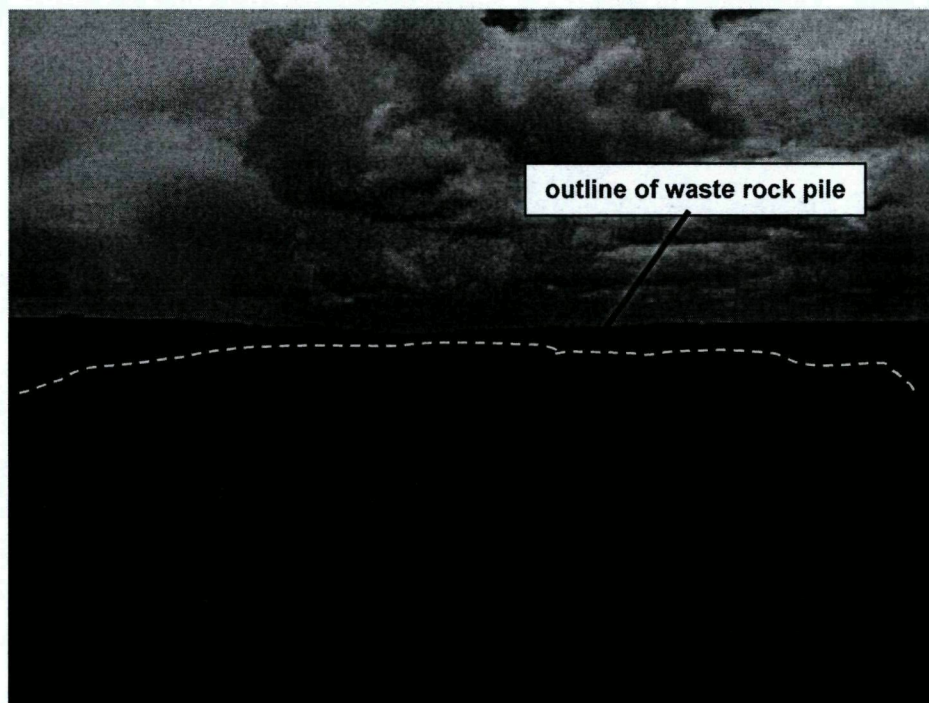
Photo Log from July 29, 2010



Photographs Section 12 Mine: No. 1, main shaft and hoist structure (view from east looking west) and No. 2, main shaft with lower part of hoist visible (view from north looking south).



Photographs Section 12 Mine: No. 3, office building (view from waste pile looking east) and No. 4, shop building (view looking south).



Photographs of Section 12 Mine: No. 5, ponded surface water on west side of Site (aka Ambrosia Lake) and No. 6, waste rock pile on south side of Site.



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RON CURRY
Secretary
SARAH COTTRELL
Deputy Secretary

Memorandum

To: LaDonna Turner, Site Assessment Manager
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: Dana Bahar, Manager, Superfund Oversight Section
Ground Water Quality Bureau, New Mexico Environment
Department

Date: October 8, 2010

Subject: Pre-CERCLIS Screening Assessment of the Section 10 Mine
(Grants Mining District), McKinley County, New Mexico:
Further action under CERCLA recommended

Site name	Section 10	Alternative names	Kermac, Regomex, Ambromex, Buffalo
Street address	not applicable	City	not applicable
Zip code	not applicable	State	New Mexico
Latitude	35.45505	County	McKinley
Longitude	107.86614	TRS	T14N, R10W, Sec 10, SE, NE, NE

DRY

Site physical description:

The Section 10 Mine ("Site") is located approximately 9.2 miles northwest of the junction of State highways 509 and 605 (Ref. 1). The Site is located in the Goat Mountain 7.5 minute USGS 1:24000 scale topographic map quadrangle at latitude 35.45505, longitude 107.86614 and elevation approximately 7,119 ft above sea level.

The total area of the Site that is disturbed is reported as 16.48 acres (Ref. 2). Access to the Site is required by permission from the private landowner of the property and the adjacent property owner whose gravel road is used to drive to the Site through a locked gate (Ref. 1). Figures 1-3 are contained in Attachment A.

The Section 10 Mine is located approximately 2,800 ft west of the Dysart Mine No. 1 site along the southern side of the ephemeral drainage named Martin Draw (Ref. 3). Martin Draw extends southeastward to join Arroyo del Puerto near the northwest end of the Rio Algom Mill Site. The Arroyo del Puerto continues southeastward until it joins San Mateo Creek below the Highway 509-605 junction.

The mine is a vertical shaft with underground workings at approximately 400-700 ft since other mines in the local area are generally completed at these depths or have underground workings in this range of depth. The mine started in 1959 and produced through 1965. Features noted at the Site included a mine dump, a metal shed, a head frame, and a ventilation shaft (Ref. 4). By 1980 shaft was secured with wire mesh fence (Ref. 2).

Site identification:

The Site is one of numerous legacy uranium sites within the Grants Mining District, Ambrosia Lake Subdistrict, San Mateo Creek watershed, Bluewater Underground Basin.

Site summary:

Anderson visited the Site in 1980 and recorded the following radiological readings of the Site main features. The main shaft measured 400 cps (24,000 cpm or 137 μ R/hr) with a high of 900 cps (54,000 cpm or 309 μ R/hr). The main rock waste dump measured 400-700 cps. The ventilation shaft air measured greater than 6,000 cps (360,000 cpm or 2,057 μ R/hr).

The target rock was the Westwater Canyon Member of the Jurassic Morrison Formation. Geologically the mines in this part of Ambrosia Lake are located within the Ambrosia Lake ore trend (northern trend) and in the vicinity of the Ambrosia Dome (Ref. 5). Ore deposits and mines in this area are located above the regional water table elevation and are "dry" mines.

Targets:

The Site is located within a few hundred feet of a small unnamed drainage that flows NW-SE to join with Martin Draw in a distance of approximately 2,150 ft. Martin Draw eventually joins the Arroyo del Puerto. The Arroyo del Puerto eventually joins the San Mateo Creek drainage. Some portion of contaminants from the Site may adhere to sediments, and propagate episodically downgradient in response to stream flows within Martin Draw, Arroyo del Puerto, and San Mateo Creek. Current details of alluvial ground water flow are unknown, but are thought to follow general topographic slope. Alluvial groundwater adjacent to and downgradient from the Site may propagate into underlying bedrock aquifers through stratigraphic, structural, and/or anthropogenic connections (e.g., leaky wells, mine shafts). Distance to the Site from the end of Highway 509 is approximately 2.5 miles.

Wells in Table 1 below are registered with the New Mexico Office of the State Engineer and located within a 4-mile radius of this mine (Ref. 6).

Site ownership and Potential Responsible Parties:

In 1957 Patten & Galassini sunk the main shaft at the Site. From 1957-1969 Kermac Nuclear Fuels Corp. operated the Site. From 1959-1962 S & A Mining Co. operated the Site as a contractor to Kermac Nuclear Fuels. In 1964 Homestake-Sapin Partners took over operation of the Site. In 1979 July Cobb starts to re-enter the shaft. From 1980-81 Cobb Resources operated the Site but the production of ore was stockpiled only (Ref. 2 and 3).

Site ownership records indicate private surface and mineral rights. A search of records at the McKinley County Courthouse did not show a surface owner.

File review:

Files and information sources that were reviewed for this assessment are listed below.

Site reconnaissance: A site reconnaissance visit was not conducted as part of this screening assessment.

Recommendation:

Additional investigation of the Site under CERCLA authority is recommended to assess any physical hazards as well as the areal extent of elevated radioactivity readings noted in the most recent Site reconnaissance to determine if threats to human health and the environment exist. NMED also recommends assessment of sediments in surface water drainages originating or crossing this Site to evaluate the potential occurrence of impacts from dispersal of waste materials that have been left on-Site.

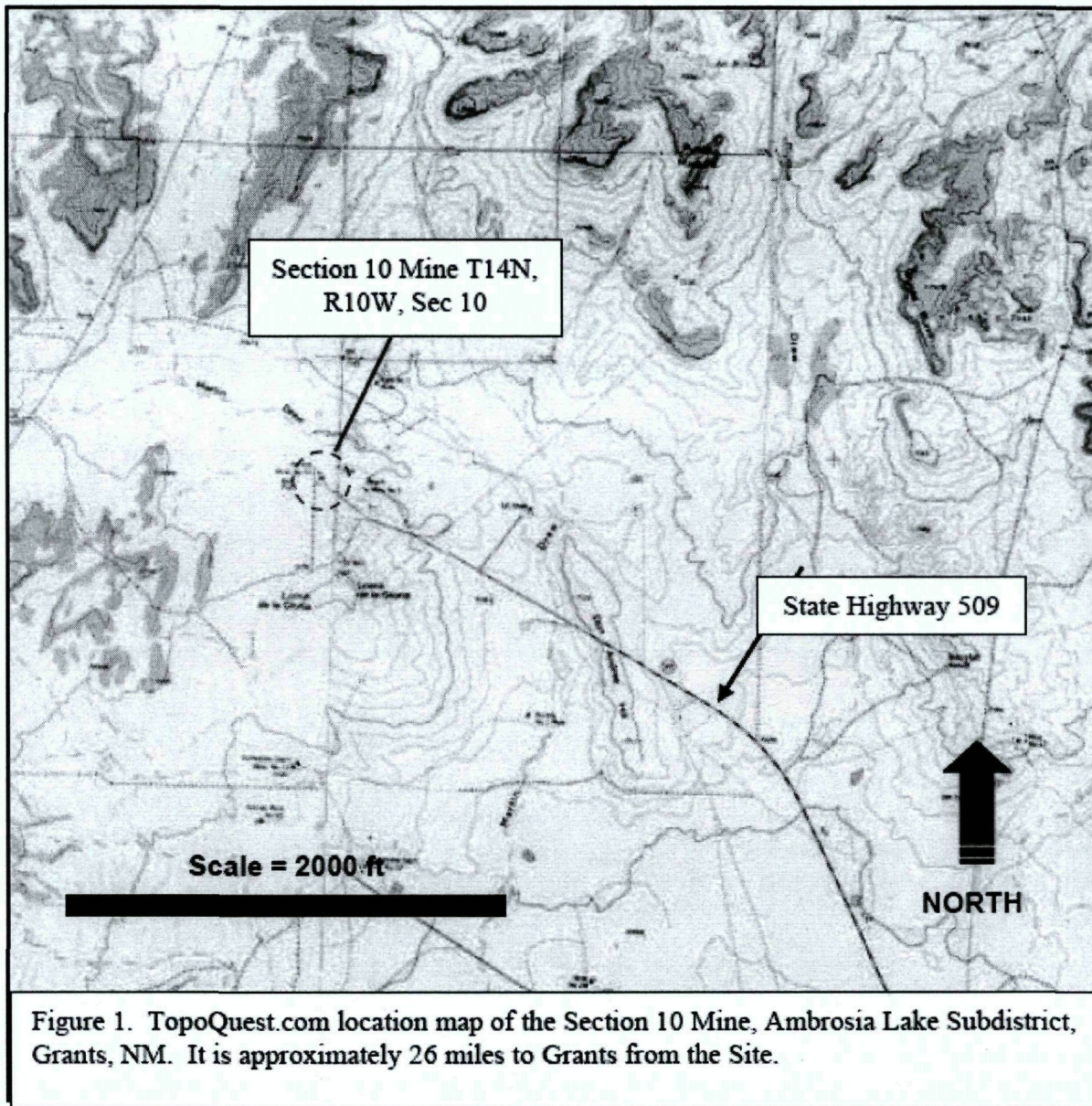
The Section 10 Mine is considered a "dry" mine because the depth of the ore that was mined is above the regional water table (Ref. 5). Currently, the existence of regional impacts from legacy uranium sites to the ground water system has not been determined. Ground water impacts from "dry" mines such as this Site initially would impact the alluvial ground water system through leaching of on-site waste materials and ore stockpiles. Such impacts, if they exist, predominantly may be localized to alluvial ground water in the vicinity of the Site from leaching prior to Site reclamation. Alternatively ground water impacts may be more widespread, contributing to the overall potential degradation of the alluvial ground water regionally, as well as potentially to impacts to ground water in underlying bedrock aquifers. A generalized investigation of potential alluvial ground water impacts from "dry" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. Depending upon the results of this investigation, additional site-specific alluvial ground water characterization might be considered.

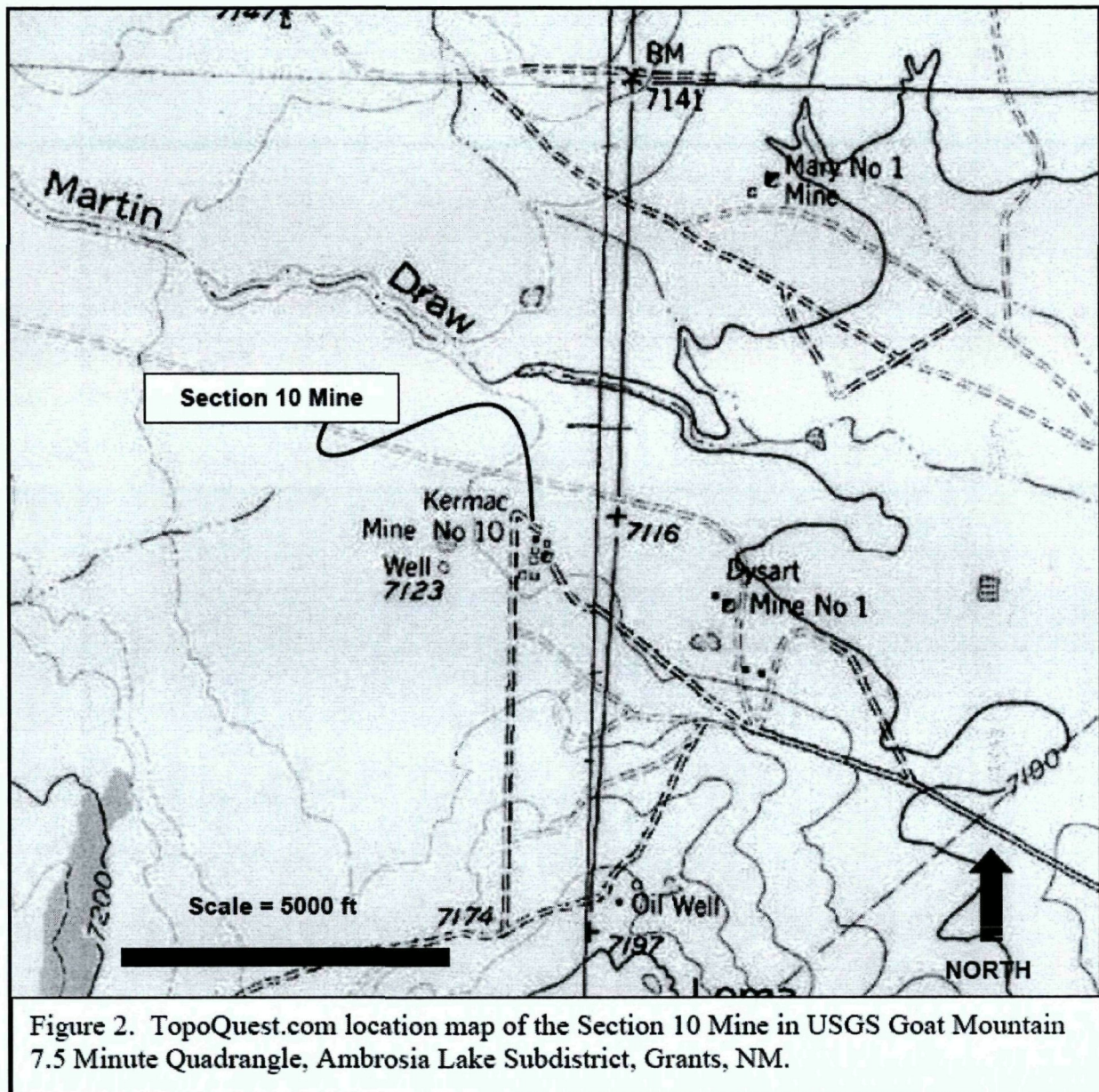
References:

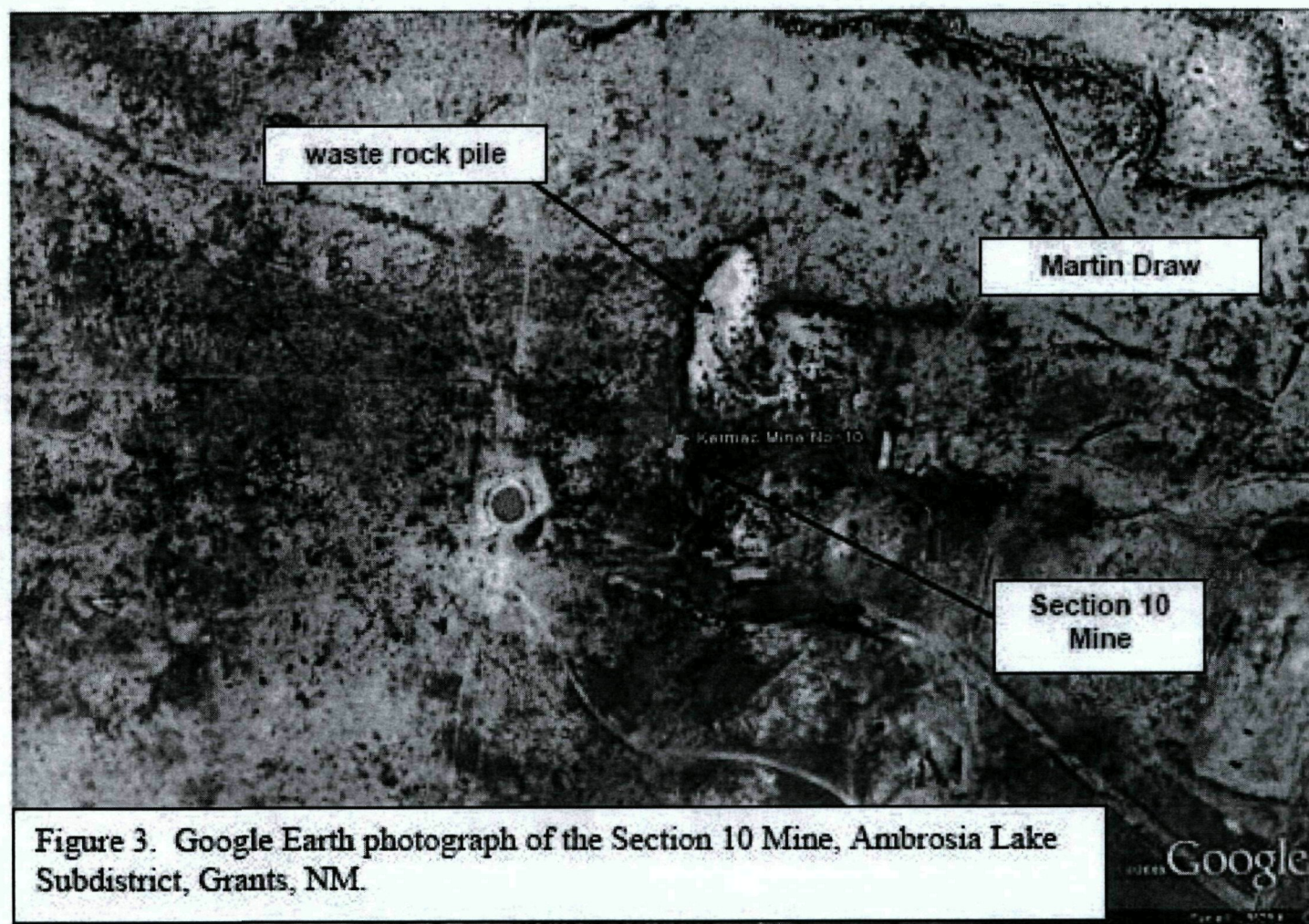
1. USGS, 1957. Goat Mountain, N, Mex. 7.5 minute quadrangle topographic map, 1:24,000 scale.
 2. New Mexico Energy, Mineral and Natural Resources Department, undated. "2007-07-20 to NMED-GWQ-Sfund.xls." Spreadsheet excerpt.
 3. McLemore, Virginia T. and William L. Chenoweth, revised December 1991. "Uranium mines and deposits in the Grants district, Cibola and McKinley counties, New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 353.
 4. Anderson, Orin J., 1980. "Abandoned or inactive uranium mines in New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 148.
 5. Zitting, R.T. et al., 1957. Geology of the Ambrosia Lake area uranium deposits, McKinley County, New Mexico, Mines Mag., v. 47, p.; 53-58.
 6. New Mexico Office of the State Engineer. "May_06_wells." Shapefile.
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Attachment A

Figures 1, 2, and 3

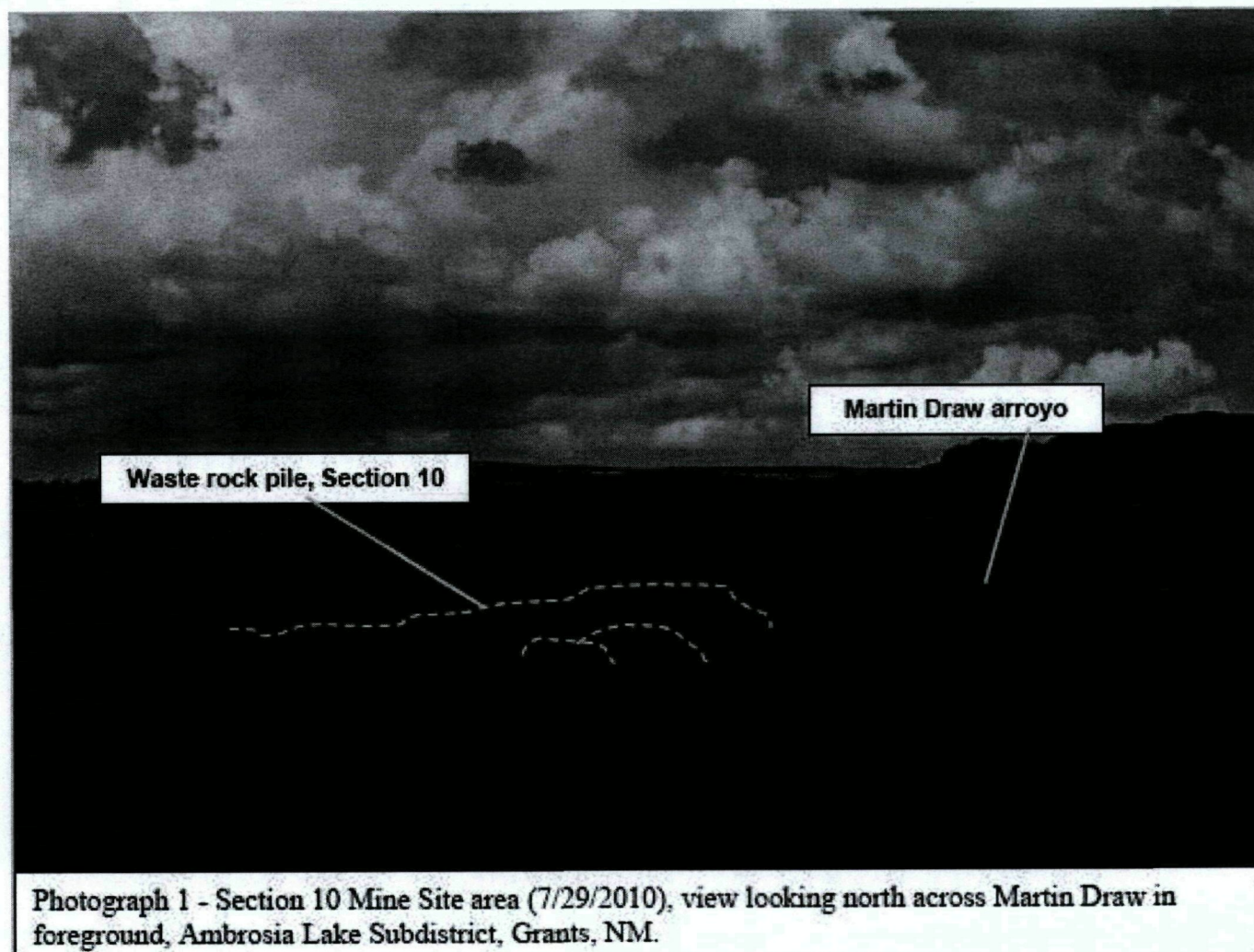






Attachment B

**Photograph Section 10 Mine Distal View
July 29, 2010**





BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

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RON CURRY
Secretary
SARAH COTTRELL
Deputy Secretary

Memorandum

To: LaDonna Turner, Site Assessment Manager
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: Dana Bahar, Manager, Superfund Oversight Section
Ground Water Quality Bureau, New Mexico Environment
Department

Date: October 8, 2010

Subject: Pre-CERCLIS Screening Assessment of the Mary No. 1 Mine
(Grants Mining District), McKinley County, New Mexico:
Further action under CERCLA recommended

Site name	Mary No. 1	Alternative names	Section 1 NWQ, Dysart No. 3
Street address	not applicable	City	not applicable
Zip code	not applicable	State	New Mexico
		County	McKinley
Latitude	35.46247	Longitude	-107.87216
		TRS	T14N, R10W, Sec. 11/NW/NE

Site physical description:

The Mary No. Mine ("Site") is located approximately 9.3 miles northwest of the junction of State highways 509 and 605 (Ref. 1). The Site is located in the Ambrosia Lake 7.5 minute USGS 1:24000 scale topographic map quadrangle at latitude 35.46247, longitude 107.87216, and elevation approximately 7,100 ft above sea level. The total area of the Site is 33.88 acres. The area that potentially has been disturbed from mining activities appears to be less than a few acres (Ref. 2). Access to the Site is required by permission from the private landowner of the property and the adjacent property owner whose gravel road is used to drive to the Site through a locked gate (Ref. 1). Figures 1-3 from the Intera 2010 report are contained in Attachment A.

The Mary No. 1 Mine is located approximately 2,300 ft north of the Dysart Mine No. 1 site along the northern side of the ephemeral drainage named Martin Draw (Ref. 3). Martin Draw extends southeastward to join Arroyo del Puerto near the northwest end of the Rio Algom Mill Site. The Arroyo del Puerto continues southeastward until it joins San Mateo Creek below the Highway 509-605 junction.

Anderson visited the Site in 1980 and found a 500 ft deep shaft that had caved in and formed a 75 ft by 75 ft deep subsidence hole (Ref. 4). Waste rock extends 600 ft from the shaft opening and a small powder magazine structure was also present. Information on the current site physical description is summarized from the report of

a site visit on April 9, 2010 conducted by a subcontractor as part of an Abandoned Uranium Mine site assessment report for the Mining and Mineral Division of the New Mexico Energy, Minerals and Natural Resources Department (Ref. 1).

No pits or open cuts were found at the Site. One disturbed area consists of a low, flat-top mound of dirt 60 ft wide X 90 ft long X 2 ft high. A vent shaft is located in the center of this low lying mound of dirt. The vent shaft contains a PVC pipe within a large metal casing. Photographs 1-6 from the Intera 2010 report are contained in Attachment B.

Reclamation activities had taken place at the Site after the 1980 site visit according to information from Mr. Al Cox with Homestake Mining Company (Ref. 1). The post 1980 reclamation work included filling in the caved shaft, removal of the powder magazine, and removal of waste piles.

Site identification:

The Site is one of numerous legacy uranium sites within the Grants Mining District, Ambrosia Lake Subdistrict, San Mateo Creek watershed, Bluewater Underground Basin.

Site summary:

The Mary No. 1 mine shaft was sunk in 1959 and was last registered at the State Mine Inspector's Office in 1966. The target rock was the Westwater Canyon Member of the Jurassic Morrison Formation. The mine yielded 357,262 tons of ore and 794,063 lbs of uranium oxide concentrate (U_3O_8 ; Ref. 5).

One disturbed area consists of a low, flat-top mound of dirt 60 feet (ft) wide X 90 ft long X 2 ft high. The maximum gamma radiation measurement at this mound is 19 $\mu R/hr$ at 4 ft above the ground surface (ags). Background surface radiation readings indicated 16 $\mu R/hr$ at surface and 4 ft ags. The maximum gamma radiation reading at the Site was 45 $\mu R/hr$ at surface.

Targets:

The Site is located within a few hundred feet of a small unnamed drainage that flows NW-SE to join with Martin Draw in a distance of approximately 2,000 ft. Martin Draw eventually joins the Arroyo del Puerto. The Arroyo del Puerto eventually joins the San Mateo Creek drainage. Some portion of contaminants from the Site may adhere to sediments, and propagate episodically downgradient in response to stream flows within Martin Draw, Arroyo del Puerto, and San Mateo Creek. Current details of alluvial ground water flow are unknown, but are thought to follow general topographic slope. Alluvial groundwater adjacent to and downgradient from the Site may propagate into underlying bedrock aquifers through stratigraphic, structural, and/or anthropogenic connections (e.g., leaky wells, mine shafts). Distance to the Site from the end of Highway 509 is approximately two miles.

Well records from the New Mexico Office of the State Engineer that are located within a four-mile radius of the Site are shown in Table 1 (Ref. 6).

Site ownership and Potential Responsible Parties

The history of Site ownership-operation and potentially responsible parties information includes the following. From 1958 to 1959 Boyles Brothers Drilling Company, of Salt Lake City, constructed the shaft as contractors to Stella Dysart and Entrada Corporation, both of Albuquerque. From 1959 to 1961 Boyles Brothers Drilling Co operated the Site under contract to Entrada Corporation. From 1961-1963 Entrada Corporation operated the Site as contractors to Stella Dysart. In 1964 Stella Dysart controlled the Site. The site was sold to Homestake-Sapin Partners on June 12, 1964. Homestake-Sapin Partners operated the Site from 1964 to 1966. Mining ceased during calendar year 1966. In 1980 United Nuclear-Homestake Partners controlled the mine, but no active mining occurred under their operational period (Ref. 2 and 5).

Site aliases during operation include the Entrada-Dysart No. 1, Entrada Boyles Shaft and Dysart No. 3.

File review:

Files and information sources that were reviewed for this assessment are listed below.

Site reconnaissance:

A field visit-site assessment was performed at the Site on April 10, 2010 by a contractor to the New Mexico

Energy, Minerals, and Natural Resources Department under the Abandoned Uranium Mine (AUM) Program. The resultant report summarizing their findings is dated May 28, 2010.

Recommendation:

Additional investigation of the Site under CERCLA authority is recommended to assess any physical hazards as well as the areal extent of elevated radioactivity readings noted in the most recent Site reconnaissance to determine if threats to human health and the environment exist. NMED also recommends assessment of sediments in surface water drainages originating or crossing this Site to evaluate the potential occurrence of impacts from dispersal of waste materials that have been left on-Site.

Currently, the existence of regional impacts from legacy uranium sites to the ground water system has not been determined. Ground water impacts from "dry" mines such as this Site initially would impact the alluvial ground water system through leaching of on-site waste materials and ore stockpiles. Such impacts, if they exist, predominantly may be localized to alluvial ground water in the vicinity of the Site from leaching prior to Site reclamation. Alternatively ground water impacts may be more widespread, contributing to the overall potential degradation of the alluvial ground water regionally, as well as potentially to impacts to ground water in underlying bedrock aquifers. A generalized investigation of potential alluvial ground water impacts from "dry" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. Depending upon the results of this investigation, additional site-specific alluvial ground water characterization might be considered.

NMED does recommend that the Mary No. 1 Mine be considered for inclusion in a district wide sediment and/or ground water investigation in order to characterize current conditions and the potential for materials left on-site to impact alluvial and/or bedrock ground water quality if environmental or active land use conditions should change.

References:

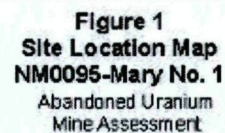
1. Intera Inc., May 28, 2010. "Abandoned uranium mine assessment for the Mary No. 1 site (NM0095)." Prepared for the New Mexico Energy, Minerals and Natural Resources Department 24 pp.
 2. New Mexico Energy, Mineral and Natural Resources Department, undated. "2007-07-20 to NMED-GWQ-Sfund.xls." Spreadsheet excerpt.
 3. USGS, 1957. Ambrosia Lake, N, Mex. 7.5 minute quadrangle topographic map, 1:24,000 scale.
 4. Anderson, Orin J., 1980(?). "Abandoned or inactive uranium mines in New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 148.
 5. McLemore, Virginia T. and William L. Chenoweth, revised December 1991. "Uranium mines and deposits in the Grants district, Cibola and McKinley counties, New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 353.
 6. New Mexico Office of the State Engineer. "May_06_wells." Shapefile.
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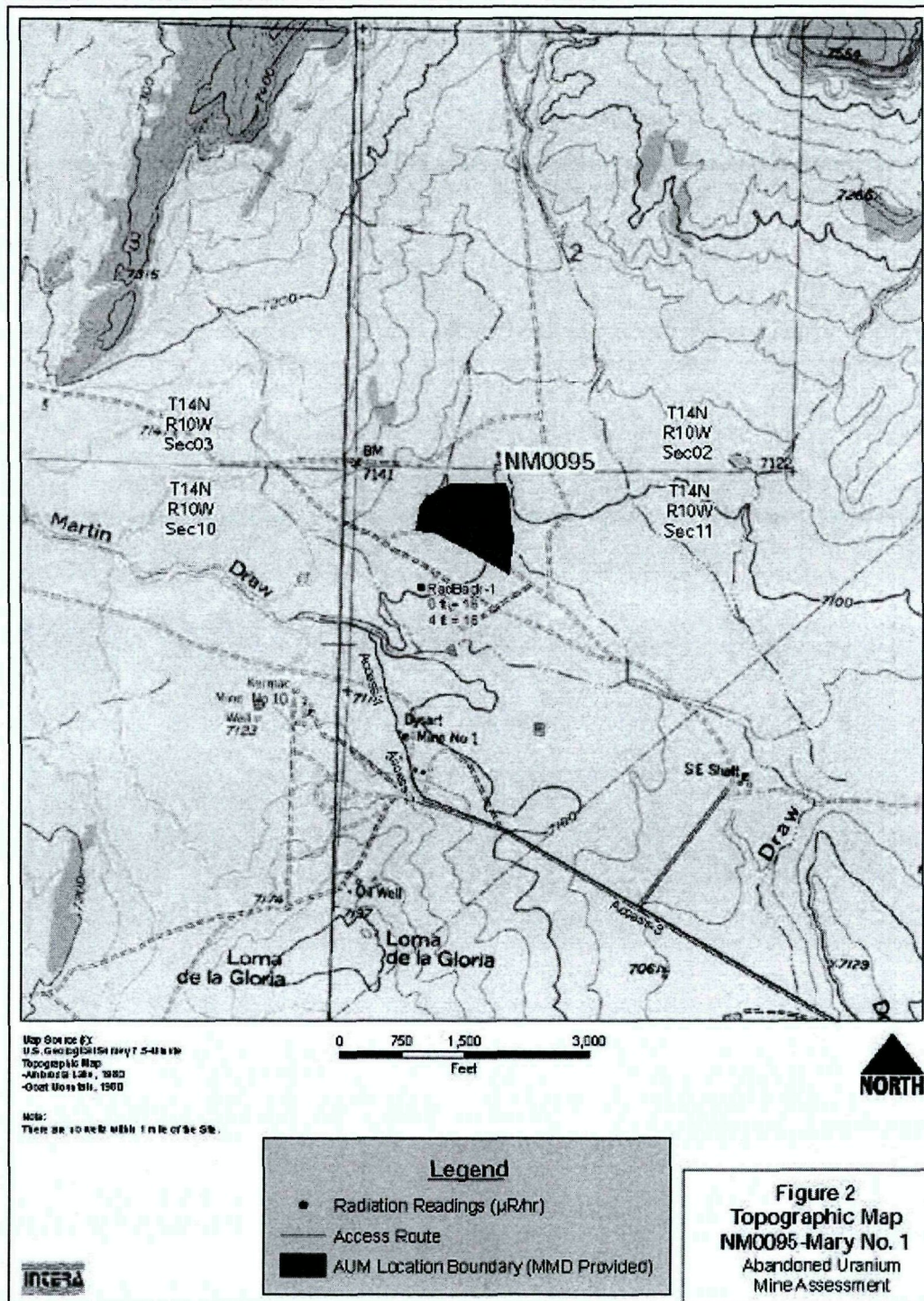
Table 1. Well records from the New Mexico Office of the State Engineer located within a 0 – 4 mile distance ring from the Mary No. 1 Mine Site, Grants Mining District, New Mexico.

distance from site (miles)	POD REC NB	POD BASIN	POD NBR	well completion date	DEPTH WELL (ft)	DEPTH WATER (ft)	CASING SIZE (in)	owner name	USE	diversion acre/ft yr
0 - 0.25										
0.25 - 0.50										
0.50 - 0.75										
0.75 - 1.0										
1.0 - 2.0	522	B	00143	7/18/1960	90.00	60.00	0.00	ANDREWS	Domestic	3
1.0 - 2.0	354	B	00373	12/31/1956	1003.00	0.00	13.38	RIO ALGOM MINING LLC	Mining	0
1.0 - 2.0	1225	B	00994	1/2/1958	827.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
2.0 - 3.0	620	B	00362	11/30/1956	3093.00	0.00	10.75	RIO ALGOM MINING LLC	Mining	0
2.0 - 3.0	29	B	00363	4/30/1956	745.00	0.00	4.50	RIO ALGOM MINING LLC	Mining	0
2.0 - 3.0	785	B	00366	12/31/1955	760.00	0.00	4.50	RIO ALGOM MINING LLC	Mining	0
2.0 - 3.0	1490	B	00372	9/12/1956	796.00	0.00	8.63	SABRE-PINON CORPORATION	Mining	0
2.0 - 3.0	532	B	00994	9/18/1958	857.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
2.0 - 3.0	1167	B	01087	5/25/1985	651.00	566.00	5.00	ALBERS BROTHERS	Stock	3
2.0 - 3.0	436	B	01246	4/29/1992	1200.00	700.00	6.63	ELKINS	Stock	3
3.0 - 4.0	97	B	00364	8/31/1956	735.00	0.00	6.00	ANDERSON DEVELOPMENT CORP.	Mining	0
3.0 - 4.0	851	B	00365	1/31/1956	793.00	0.00	6.63	ANDERSON DEVELOPMENT CORP.	Mining	0
3.0 - 4.0	183001	B	00371	8/25/1956	752.00	0.00	8.63	SABRE-PINON CORPORATION	Mining	0
3.0 - 4.0	1285	B	00522	2/7/1978	70.00	0.00	0.00	UNITED NUCLEAR-HOMESTAKE PTNRS	Monitor Well	0
3.0 - 4.0	180648	B	00522	2/7/1978	70.00	0.00	5.00	UNITED NUCLEAR-HOMESTAKE PTNRS	Monitor Well	0
3.0 - 4.0	71	B	00771	2/2/1980	2070.00	1025.00	7.00	PATHFINDER MINES CORP.	Prospecting	0
3.0 - 4.0	378	B	00994	3/23/1968	810.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
3.0 - 4.0	823	B	00994	3/16/1970	779.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
3.0 - 4.0	1428	B	00994	4/5/1959	1094.00	0.00	0.00	RIO ALGOM MINING LLC	Mining	5227
POD REC NBR: point of diversion record number.					B: Bluewater Basin					
POD BASIN: point of diversion basin										
POD NBR: point of diversion number										

Attachment A

Figures 1, 2, and 3 from Intera, 2010 report







Attachment B

Photo Log from Intera 2010 report

Abandoned Uranium Mine Assessments

May 2010



Photo 1-Site photo, looking northwest.

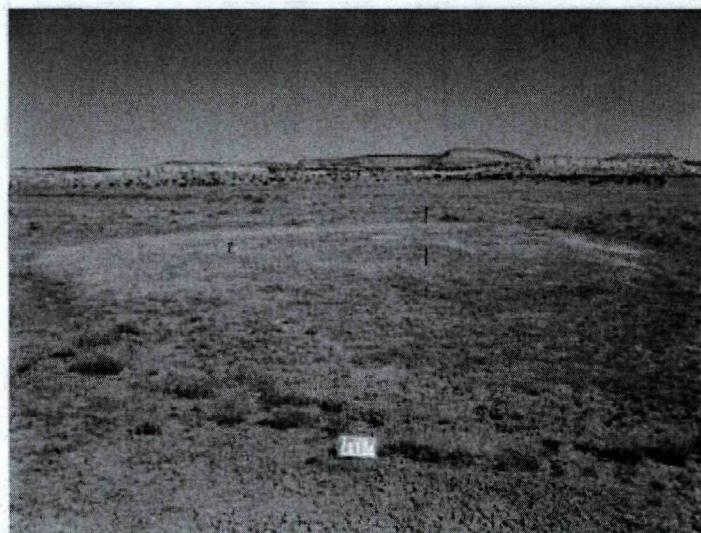


Photo 2-Looking northwest at DistPly-1.





Photo 5-View down vent shaft (MiscPt-1).

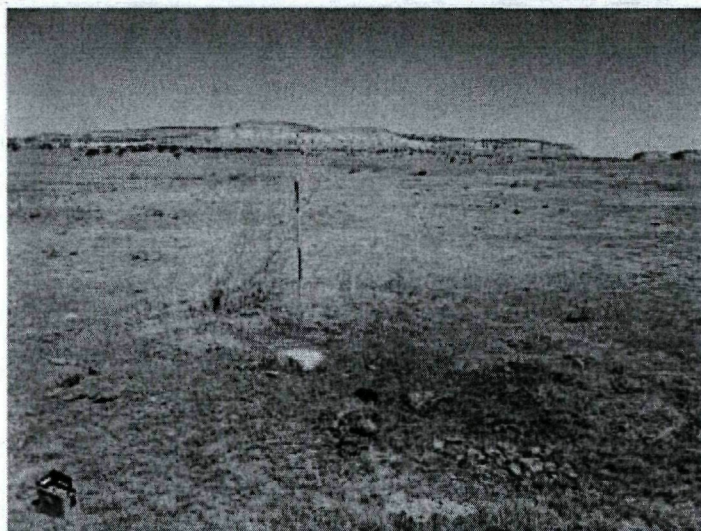


Photo 6-At MMD provided shapefile location, looking north.

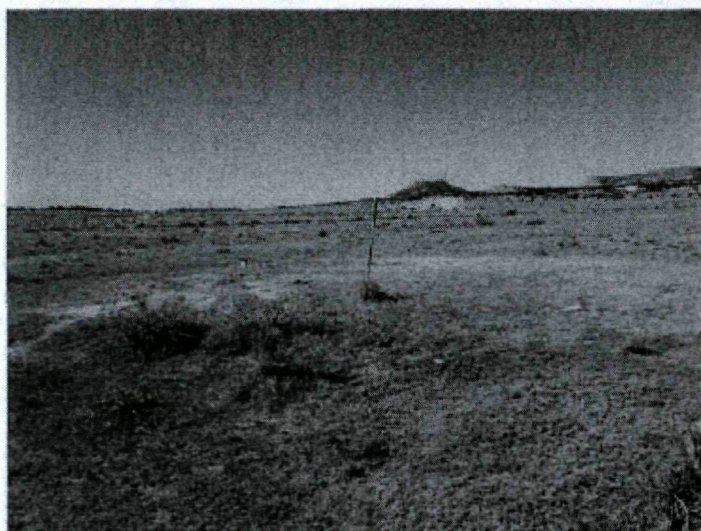


Photo 3-Looking southwest at DistPly-1.



Photo 4-A vent shaft (MiscPt-1) in DistPly-1.



BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

NEW MEXICO
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RON CURRY
Secretary
SARAH COTTRELL
Deputy Secretary

Memorandum

To: LaDonna Turner, Site Assessment Manager
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: Dana Bahar, Manager, Superfund Oversight Section
Ground Water Quality Bureau, New Mexico Environment
Department

Date: October 8, 2010

Subject: Pre-CERCLIS Screening Assessment of the Vallejo Mine
(Grants Mining District), McKinley County, New Mexico:
Further action under CERCLA recommended

Site name	Vallejo Mine	Alternative names	Double Jerry, Section 34, Farris No. 1	
Street address	not applicable	City	not applicable	State New Mexico
Zip code	not applicable	County	McKinley	
Latitude	35.31298	Longitude	107.77149	TRS T12N, R9W, Sec 34

Site physical description:

The Vallejo Mine Site ("Site") is located approximately 2.5 miles directly south of the junction of State highways 509 and 605 (Ref. 1). The Site is approximately 11.5 miles north of Grants, NM. The Site is located in the Dos Lomas 7.5 minute USGS 1:24000 scale topographic map quadrangle at latitude 35.31298, longitude 107.77149, and elevation approximately 7,329 ft above sea level. The total area of the Site is unknown, but the estimated area of disturbance is 2 acres (Ref. 2).

Access to the Site is required by permission from the landowner whose land must be crossed to access the site, Mr. Robert Schmitt. Figure 1 is a general location map and Figure 2 is a site map of Section 34. Figure 3 is a copy of a figure-photograph from a 2008 report (Ref. 3). Figures 1, 2, and 3 are contained in Attachment A.

The Site is located along the western margin of La Jara Mesa and along the eastern margin of the alluvial valley for San Mateo Creek (Ref. 3).

Site identification:

The Site is one of numerous legacy uranium sites within the Grants Mining District, Ambrosia Lake Subdistrict, San Mateo Creek watershed, Bluewater Underground Basin.

Site summary:

Based on a visit by Anderson, 1980, approximately 2 acres were disturbed. The portal indicated 350-600 counts per second (cpm) or 21,000-36,000 counts per minute (120-206 $\mu\text{R/hr}$). In 1980 there was a visible head frame and load out area; a caved incline (shaft); the wooden timber was in poor condition, a powder magazine was present; and a mine dump was present (Ref. 2).

A field visit-site assessment was performed on March 13, 2008 by a contractor to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (MMD). The resultant report summarizing their findings is dated July 18, 2008.

Targets:

The Site is located on the highlands above the San Mateo Creek surface water drainage.

Potential impacts to the alluvial ground water system during Site operation may have occurred from ground water discharges from mine workings to settling ponds and ultimately to the San Mateo Creek drainage. Some portion of discharged contaminants may adhere to sediments, and propagate episodically downgradient in response to stream flows within the San Mateo Creek drainage. Current details of alluvial ground water flow are unknown, but are thought to follow general topographic slope (i.e., locally southward from the site, and generally westward in the direction of surface water flow). Such alluvial ground water impacts may also propagate into underlying bedrock aquifers through stratigraphic, structural, and/or anthropogenic (e.g., leaky wells, mine shafts) interconnections. Additional contaminant mobilization in ore-bearing Westwater Canyon Formation could result from oxygenated ground water influx resulting from progressive basin recharge following cessation of mining activities.

Well records from the New Mexico Office of the State Engineer that are located within a four-mile radius of the Site are shown in Table 1 below (Ref. 5). The Site is located within 10,000 ft of San Mateo Creek.

Site ownership and Potential Responsible Parties:

The history of the Site ownership and potentially responsible parties information includes the following. In 1956 Farris Mines drove incline. In February 1957 Farris Mines, of Grants, began construction of the mine portal under contract to Vallejo Uranium Mines of Vallejo, California. From 1957-1959 Vallejo Uranium Mines, Inc. operated the Site. From 1959-1960 Samson Oil & Mineral Co. operated the Site. From 1962-1963 Penta Mining Co. operated the Site (Ref. 2 and Ref. 5). The Site is located on land of the Cibola National Forest under management by the US Forest Service (USFS). The USFS owns the surface and mineral rights at the Site.

File review:

Files and information sources that were reviewed for this assessment are listed below.

Site reconnaissance:

A field visit-site assessment was performed on March 13, 2008 and a final report is dated July 18, 2008 by Souder Miller Associates under contract to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (MMD). No evidence of human activity was noted. The radiological survey measurements are as follows. The ground surface maximum radioactivity measurement was 240 $\mu\text{R/hr}$ and the minimum measurement was 12 $\mu\text{R/hr}$. Four-foot high radioactivity measurements were 180 $\mu\text{R/hr}$ and the minimum measurement was 12 $\mu\text{R/hr}$. Background radiation at the Site is approximately 12 $\mu\text{R/hr}$.

There were no obvious signs of mine workings on the Site. A small, 10,000 ft^2 level area was noted, as was a wooden foot bridge across the arroyo bounding the southern extent of the area (See Figure 3). According to Chuck Hagerman with US Forest Service (Grants, NM), the mine was reclaimed in the late 1980s (Ref. 3). There were signs of small animal life on the Site. The land use is designated for grazing of livestock.

Table 1. Well records from the New Mexico Office of the State Engineer located within a 0 – 4 mile distance ring from the Vallejo Mine Site, Grants Mining District, New Mexico

distance from site (miles)	POD REC NB	POD BASIN	POD NBR	well completion date	DEPTH WELL (ft)	DEPTH WATER (ft)	CASING SIZE (in)	owner name	USE	diversion acre/ft yr
0 - 0.25										
0.25 - 0.50										
0.50 - 0.75										
0.75 - 1.0										
1.0 - 2.0	233	B	01340		300.00	0.00	5.50	JAEGER	Domestic	3
1.0 - 2.0	1419	B	01341		300.00	0.00	6.00	ROUNDY	Multiple domestic	3
1.0 - 2.0	227069	SP	03384		0.00	0.00	0.00	ROUNDY	Irrigation	0
2.0 - 3.0	18	B	00415	8/30/1977	59.00	30.00	5.00	NEW MEXICO E.I.A.	Domestic	3
2.0 - 3.0	992	B	00415	8/30/1977	72.00	30.00	5.00	NEW MEXICO E.I.A.	Domestic	3
2.0 - 3.0	936	B	00415	8/10/1977	95.00	72.00	5.00	NEW MEXICO E.I.A.	Domestic	3
2.0 - 3.0	165	B	00415	8/30/1977	54.00	30.00	5.00	NEW MEXICO E.I.A.	Domestic	3
2.0 - 3.0	328	B	00415	8/30/1977	57.00	32.00	5.00	NEW MEXICO E.I.A.	Domestic	3
2.0 - 3.0	180546	B	00558		0.00	0.00	0.00	N.M. STATE HWY DEPT.	Public	3
2.0 - 3.0	1391	B	00659	1/18/1979	220.00	190.00	0.00	GARCIA	Domestic	3
2.0 - 3.0	770	B	00778		0.00	0.00	0.00	ROUNDY	Stock	3
2.0 - 3.0	444	B	00778		0.00	0.00	0.00	ROUNDY	Stock	3
2.0 - 3.0	1004	B	00861		0.00	0.00	0.00	SANDOVAL	Domestic	3
2.0 - 3.0	24415	RG	62079		0.00	0.00	0.00	VALDEZ	Sanitary	3
3.0 - 4.0	288	B	00113	8/3/1961	100.00	55.00	4.00	STEELE	Domestic	3
3.0 - 4.0	832	B	00305		0.00	0.00	0.00	WILSON	Sanitary	3
3.0 - 4.0	1386	B	00414		0.00	0.00	0.00	RESERVE OIL & MINERALS CORP	Sanitary	3
3.0 - 4.0	706	B	00415	3/23/1978	32.00	15.00	5.00	NEW MEXICO E.I.A.	Domestic	3
3.0 - 4.0	538	B	00415	8/11/1977	90.00	73.00	5.00	NEW MEXICO E.I.A.	Domestic	3
3.0 - 4.0	898	B	00415	8/12/1977	80.00	74.00	5.00	NEW MEXICO E.I.A.	Domestic	3
3.0 - 4.0	565	B	00456		0.00	0.00	0.00	SANDOVAL	Stock	3
3.0 - 4.0	1440	B	00521	9/25/2003	320.00	198.00	4.00	DAVEY	Domestic	3
3.0 - 4.0	375	B	00997		0.00	0.00	0.00	MARQUEZ	Multiple domestic	3
3.0 - 4.0	259	B	01104	4/2/1986	303.00	247.00	4.00	SANDOVAL	Domestic	3
3.0 - 4.0	804	B	01115	7/21/1986	478.00	204.00	4.00	MARQUEZ	Domestic	3
3.0 - 4.0	163876	B	01458	3/7/2001	702.00	126.00	4.00	ELKINS	Domestic	3
3.0 - 4.0	175541	B	01485	1/28/2002	580.00	280.00	4.00	MARQUEZ	Domestic	3
3.0 - 4.0	209713	B	01636	5/10/2005	260.00	80.00	4.00	GARCIA	Domestic	3
POD REC NBR: point of diversion record number.								B: Bluewater Basin		
POD BASIN: point of diversion basin								SP: Surface Permit		
POD NBR: point of diversion number								RG: Rio Grande Basin		

Recommendation:

It is important to note that this Site is located in a remote location with rugged terrain that is not easily accessed by assessment crews or trespassers. The Site should be assessed for potential physical hazards, especially any compromise to the cover of the open shaft. The old powder box or magazine may be a hazard to humans and animals if it contains aged explosives or blasting caps.

The Site is assigned a low priority for additional investigation under CERCLA authority because the Site is located in a remote area with rugged terrain that is not easy to access. The reconnaissance radioactivity readings indicate waste rock levels are 15-20 times the surface soil background level of 12 $\mu\text{R/hr}$. The Site should be evaluated to determine if threats to human health and the environment exist from radioactivity at the Site. NMED also recommends assessment of sediments in the Site vicinity in order to evaluate the potential occurrence of impacts from dispersal of waste materials that have been left on-Site.

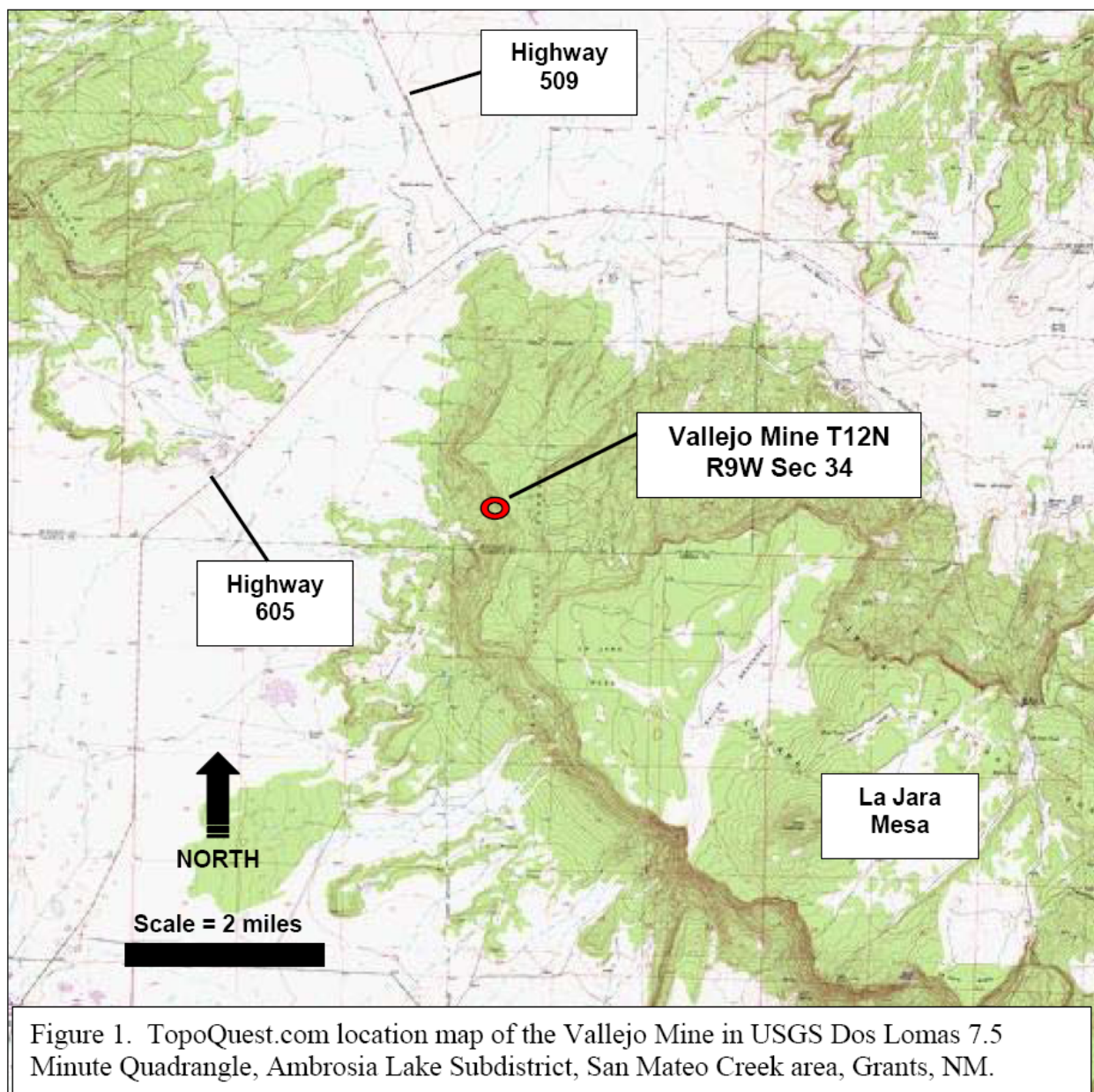
Currently, the existence of regional impacts from legacy uranium sites to the ground water system has not been determined. A generalized investigation of potential ground water impacts from "wet" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. If this generalized investigation were to indicate a potential for alluvial and/or deep ground water impacts, on-Site or adjacent installation of one or more monitor wells may be considered necessary.

References:

1. USGS, 1957. Dos Lomas, N, Mex. 7.5 minute quadrangle topographic map, 1:24,000 scale.
 2. New Mexico Energy, Minerals and Natural Resources Department, undated. "2007-07-20 to NMED-GWQ-Sfund.xls." Spreadsheet excerpt.
 3. Soder Miller Associates, 2008. Abandoned Uranium Mine Field Survey Project, prepared for NM EMNRD, MMD, 7/18/2008, 220 pp.
 4. New Mexico Office of the State Engineer. "May_08_wells." Shapefile.
 5. USGS, 1957. Dos Lomas, N, Mex. 7.5 minute quadrangle topographic map, 1:24,000 scale..
 5. McLemore, Virginia T. and William L. Chenoweth, revised December 1991. "Uranium mines and deposits in the Grants district, Cibola and McKinley counties, New Mexico." New Mexico Bureau of Mines and Mineral Resources Open-file report 353.
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Attachment A

Figures 1, 2, and 3



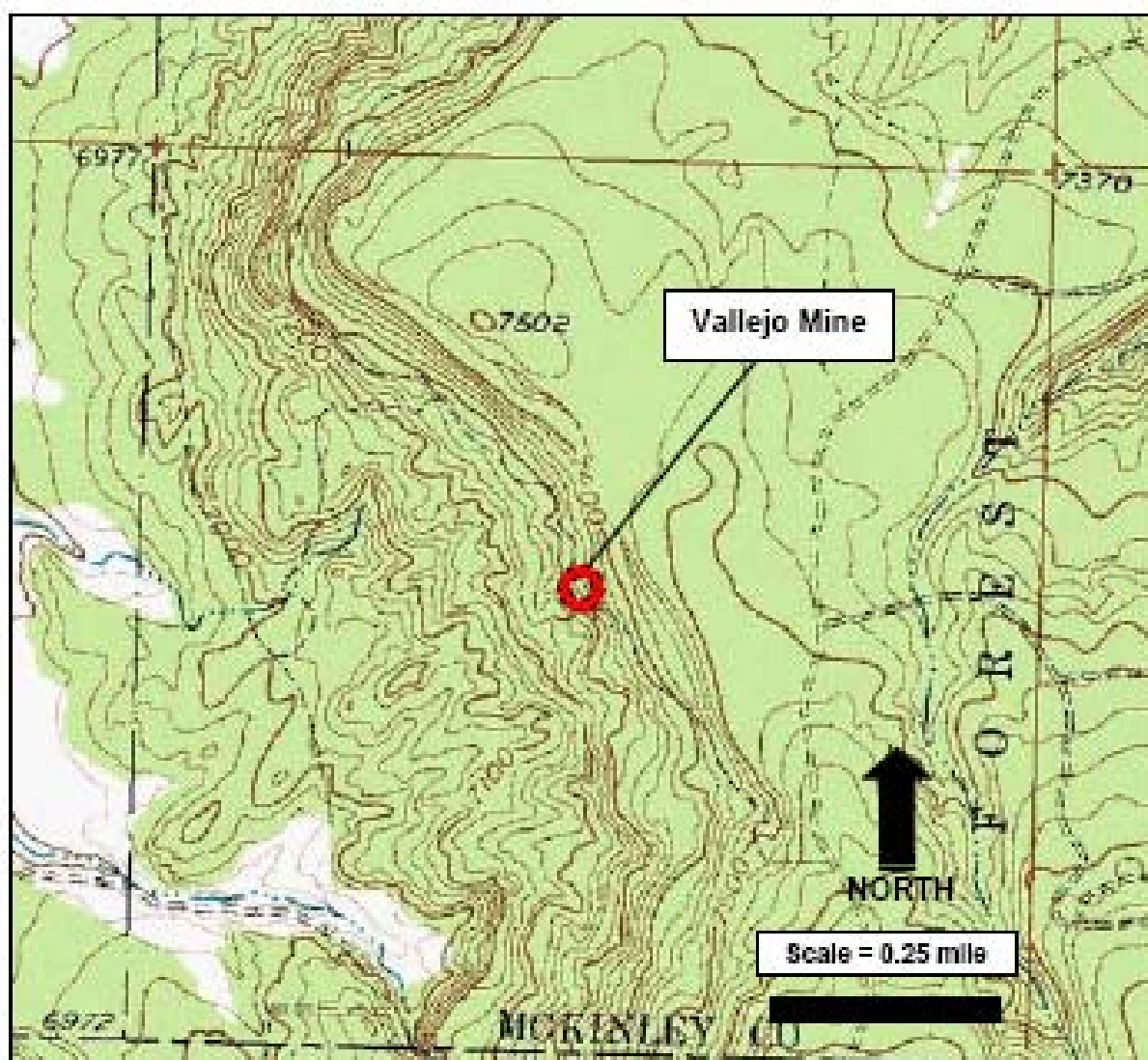
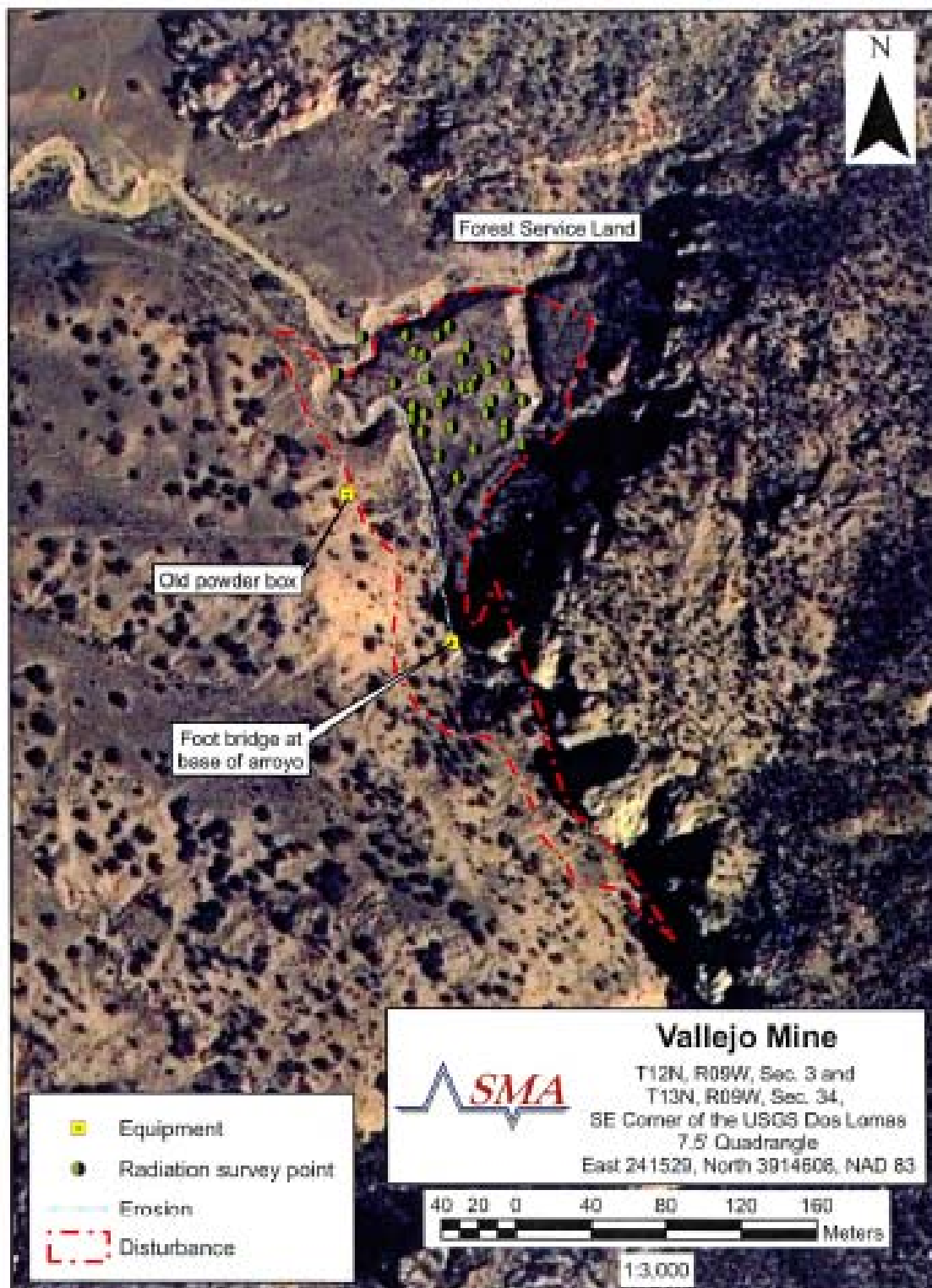


Figure 2. TopoQuest.com location map of the Vallejo Mine in the Dos Lomas Quadrangle USGS 7.5 topographic map, T12N, R9W, Sec 34, Ambrosia Lake Subdistrict, Grants, NM.



Attachment B

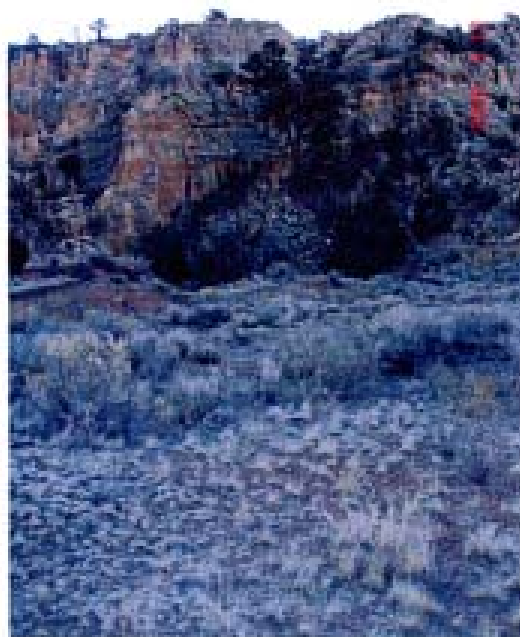
Photo Log from March 13, 2008



Overview



View east



View east



View west